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# The American STATISTICIAN

The news publication of the  
AMERICAN STATISTICAL ASSOCIATION

OCTOBER 1953  
Volume 7, No. 4

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## Arrangements for Annual Meeting in December

Arrangements for the annual meeting of the American Statistical Association, which will be held at the Shoreham Hotel in Washington, Dec. 27-30, 1953, are well under way. The following people are serving on the Local Arrangements Committee:

<i>Chairman</i> .....	DONALD C. RILEY, Bureau of the Budget
<i>Vice Chairman in Charge of Operations</i> .....	EMMETT WELCH, Office of Defense Mobilization
<i>Vice Chairman in Charge of Finance</i> .....	SAMUEL DENNIS, Foreign Operations Administration
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<i>Exhibits</i> .....	JOHN GRADY, Office of Defense Mobilization
<i>Fee Events</i> .....	DUDLEY YOUNG, Bureau of Labor Statistics
<i>Information</i> .....	WILLIAM PABST, JR., Navy
<i>Meeting Rooms and Arrangements</i> .....	PAUL KRUEGER, Bureau of the Budget
<i>Membership and Employment Register</i> .....	JOHN SMITH, American University
<i>Publicity</i> .....	HENRY CAULFIELD, Department of the Interior
<i>Registration</i> .....	LOWELL GALT, Census
<i>Social Events</i> .....	SELMA GOLDSMITH, Commerce Department
<i>Tours and Transportation</i> .....	EZRA GLASER, Bureau of the Budget

Several societies in related fields are holding their meetings in Washington at the same time as the ASA. These include the American Economic Association, the Catholic Economic Association, the American Association of University Teachers of Insurance, the American Business Law Association, the American Finance Association and the Econometric Society, all meeting at the Statler Hotel; the American Marketing Association and the Industrial Relations Research Association, meeting at the Mayflower Hotel; and the Biometrics Society-ENAR and the Institute of Mathematical Statistics, meeting at the Shoreham Hotel.

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### ADVANCE REGISTRATION FOR ANNUAL MEETING

ASA members attending the December meeting in Washington will have an opportunity to register in advance, thus saving pain and strain on arriving at headquarters at the Shoreham Hotel.

Present plans call for mailing advance Registration Blanks by mid-November to all the membership. The nominal Registration Fee of \$2.00 will be the only financial commitment required, but there will be a chance to make hotel reservations and reserve places at the popular Fee Events.

Registration plans also call for prompt interchange of information on "Who's Where" as registrants check in at the several Association headquarters.

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### CONTRIBUTED PAPERS SESSION STILL OPEN

Professor Herbert Solomon, Chairman of the 1953 Program Committee, wishes to announce that there are still openings for papers to be presented at the Contributed Papers Session at the Annual Meeting in Washington, D. C., December 27-30.

Persons who are interested in presenting a paper at the Annual Meeting are invited to write directly to Dr. Max Woodbury, Department of Statistics, Wharton School, University of Pennsylvania, Philadelphia, Pennsylvania, Coordinator of this Session.

## The American STATISTICIAN

OCTOBER, 1953, VOL. VII, NO. 4

The news publication of the  
American Statistical Association

Founded 1839

### EDITORIAL COMMITTEE

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The Editorial Committee welcomes the submission of manuscripts for possible publication. Two copies, double-spaced, should be sent to the Editor, Almarin Phillips, E-140 Dietrich Hall, University of Pennsylvania, Philadelphia 4.

News and notes should be sent to Dana Barbour, News Editor, American Statistical Association, 1108 16th Street, N.W., Washington 6, D. C.

## EMPLOYMENT REGISTER

An Employment Register will be maintained by the American Statistical Association at its December 1953 Annual Convention in Washington, D. C.

Both employers in search of personnel and members who are seeking new positions should make their needs known by writing in advance of the Annual Meeting to the Employment Register Chairman:

JOHN H. SMITH  
American University  
1901 F Street, N.W.  
Washington 6, D. C.

## Mark Your Calendar Now

for

American Statistical Association's Annual Convention

### DECEMBER 1953

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Shoreham Hotel — Washington, D. C.

Entered as second class matter March 11, 1938, at the post office at Washington, D. C., under act of March 3, 1897. The American Statistician is published five times a year—February, April, June, October and December—by the American Statistical Association, Editorial Office: 1108 16th Street, N.W., Washington 6, D. C. Subscription rate: one dollar and fifty cents a year or thirty-five cents per copy.

Anyone wishing to change their mailing address should allow eight weeks' notice. A copy of the address taken from an issue of the periodical should accompany the change-of-address request.

## Operations Research Society of America

The fall meeting of the Operations Research Society of America is to be held at the Statler Hotel in Boston on Monday and Tuesday, November 23-24. Four sessions will be held for contributed papers on the following topics: Military Operations Research (unclassified); Industrial Operations Research; Theoretical Developments; Case Histories. In addition, two sessions will be held for invited papers, one on the theory of search, and one on inventory control and production scheduling. Inquiries concerning the meeting should be addressed to David B. Hertz, Director of Engineering, Celanese Corporation of America, 290 Ferry St., Newark 5, N. J.

At its meeting of May 15 and 16, 1953, the Society elected two new officers. Dr. Robert Rinehart of the Case Institute of Technology was elected President, and Dr. Jacinto Steinhardt, Director of the Navy's Operations Evaluation Group, Vice-President. Other officers of the Society are John B. Lathrop of Arthur D. Little, Inc., Secretary, and Alfred N. Watson of the Curtis Publishing Co., Treasurer.

The Society, which was formed last year to meet the professional needs of scientists engaged in operations research, now has a membership of approximately 500, drawn from such diverse fields as industry, private and military scientific research, merchandising, and non-military government activities.

## New French Journal in Applied Statistics

The Centre de Formation des Ingenieurs et Cadres aux Applications Industrielles de la Statistique of the Institut de Statistique at the University of Paris has begun publication of a journal, "Revue de Statistique Appliquee". This publication has the three-fold objective of presenting to the public simple examples of the application of statistics to industry, of keeping technicians and engineers informed of methodological advances both in France and abroad, and of putting at the disposal of industrial users of statistics convenient reference material.

The Center for Training Engineers and Staff in the Industrial Applications of Statistics was created at the Institute of Statistics of the University of Paris at the end of 1952. In addition to publishing the "Review of Applied Statistics" the Center offers training courses both at an elementary and advanced level, and operates a bureau for consultation and study of specialized problems.

## Joint Computer Conference and Exhibition

"Information Processing Systems—Reliability and Requirements", is the theme of the Joint Computer Conference and Exhibition to be held at the Statler Hotel, Washington, D. C., December 8-10, 1953. This Conference and Exhibition is sponsored by the American Institute of Electrical Engineers, the Institute of Radio Engineers, and the Association for Computing Machinery.

The program includes papers describing the reliability of existing large scale electronic digital computing machines as well as other papers describing reliability requirements for certain necessary applications in the fields of government, business and

industry. Inspection trips will permit actual demonstrations of the topics under discussion. A large exhibit area will bring together the products of more manufacturers for this conference than has ever been possible heretofore.

Preliminary programs and reservation applications will be mailed shortly to all members of the sponsoring organizations. Others may request this information by writing Mr. L. R. Johnson, Registration Committee Chairman, 2018 Sycamore Drive, Falls Church, Virginia.

## Expanded Statistics Program at University of Chicago

An expanded comprehensive program in statistics for research workers and students in the Chicago area is being offered by the Committee on Statistics in the Divisions of the Physical and Social Sciences of the University of Chicago under the chairmanship of W. Allen Wallis. These courses, which are in addition to the Committee's program in Mathematical Statistics, will be offered in the late afternoon and evening and they can be taken either on a credit or non-credit basis. The program consists of an introductory course, three parallel three-course sequences, and a course on each of the special topics of quality control and sample surveys. One of the three-course sequences will be offered at the University's Downtown Center and will draw its illustrations primarily from business. The second of the three-course sequences is essentially the same as the first but will be offered on the Campus and the illustrations will be taken from various fields. The third three-course sequence is more intensive especially with respect to topics applicable in the laboratory sciences and it will be taught by K. Alexander Brownlee, a member of the Committee on Statistics and author of *Industrial Experimentation*. The program is being offered in cooperation with the School of Business in University College. People desiring further information should write or telephone the Director of Business Studies, University College, Haskell Hall, The University of Chicago.

## Research Fellowship in Psychometrics

The Educational Testing Service is offering for 1954-55 its seventh series of research fellowships in psychometrics leading to the Ph.D. degree at Princeton University. Open to men who are acceptable to the Graduate School of the University, the two fellowships each carry a stipend of \$2,500 a year and are normally renewable.

Fellows will be engaged in part-time research in the general area of psychological measurement at the offices of the Educational Testing Service and will, in addition, carry a normal program of studies in the Graduate School. Competence in mathematics and psychology is a prerequisite for obtaining these fellowships. The closing date for completing applications is January 15, 1954. Information and application blanks will be available about November 1st and may be obtained from: Director of Psychometric Fellowship Program, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.



# Federal Statistical Activities

## Principal Changes in Federal Statistical Programs for Fiscal Year 1954

A number of changes are being made in the programs of the principal statistical agencies as a result of reductions in appropriations for the fiscal year 1954, ending June 30, 1954. The following summary presents brief descriptions of appropriation action and program changes for the Bureau of Agricultural Economics (Agriculture), Bureau of the Census (Commerce), National Office of Vital Statistics (Health, Education and Welfare), Bureau of Labor Statistics (Labor), and the Housing Research Program (Housing and Home Finance Agency).

### DEPARTMENT OF AGRICULTURE

#### Bureau of Agricultural Economics

1953 appropriation	\$5,428,000
1954 appropriation	5,404,000

The appropriation for the Bureau of Agricultural Economics is divided between "Economic Investigations" and "Crop and Livestock Estimates."

For "Economic Investigations," the appropriation request for 1954 included an increase of \$51,600 for economic research relating to alternative combinations of land-use and conservation practices. The Congress approved the purpose of this requested increase, but stated that the full amount requested for the purpose should be provided from the appropriation of \$2,246,000 for "Economic Investigations"—a reduction of \$124,000 from the amount appropriated for fiscal year 1953. In order to finance the new activity, reductions are being made in other activities, including research on credit problems, farm land values and valuation, water utilization, marketing, and other areas.

For "Crop and Livestock Estimates," the appropriation for 1954 is \$3,158,000—an increase of \$100,000 over the amount appropriated for 1953. The increase was granted to provide for the development of new and improved methods and practices in crop and livestock reporting. A small methodology research unit is being established to work on improvement of the reporting system, with the assistance of outside statisticians and representatives of land-grant colleges.

### DEPARTMENT OF COMMERCE

#### Bureau of the Census

##### I. Economic Censuses

Legislation enacted in 1948 directed that censuses of manufactures, mineral industries, business, and transportation be taken at five-year intervals, on a fixed time schedule covering the years ending in "3" and "8." About \$1,600,000 was appropriated for preparatory work for these censuses in fiscal years 1952 and 1953, and the request for fiscal 1954 included \$11,500,000 for costs of taking the censuses in that year. Similarly, legislation enacted last year provided that the quinquennial census of agriculture be taken in October 1954, and the Budget request for fiscal 1954 included \$2,200,000 for preparatory work for this census.

As finally enacted, the 1954 appropriation eliminated all funds for the censuses of manufactures, mineral industries, business, transportation, and agriculture, but allowed \$1,500,000 "for expenses for 'spot checking' business, manufactures, and agriculture in such manner as the Secretary of Commerce shall decide to be most helpful and informative to said undertakings." As a result, all work on the censuses has been stopped. It is hoped that it may be possible to salvage some part of the results of the preparatory work which had been completed for use in the next complete censuses in these fields.

The "spot check" program authorized by Congress differs materially from that contemplated for the censuses. The following program has been approved by the Secretary of Commerce:

1. *Adapting the Census sample design and organization to the "spot checking" program.* This involves substituting approximately 230 sample areas for the existing 68-area sample and improving the Bureau's field sampling procedures in order to increase the amount of detail which "spot check" surveys can be made to yield. \$270,000
2. *Retail trade statistics.* To provide (a) more detailed monthly statistics of retail trade by kind of business, (b) regional breakdowns of retail sales by major kinds of business for the year 1953, and (c) improvement of information on monthly changes in retail inventories. \$290,000
3. *Wholesale trade.* To provide by a sample survey national totals of wholesale sales and inventories in 1953 and set up a sample from which monthly trend data can be developed. \$ 70,000
4. *Service trades.* To provide national estimates of expenditures for selected services in 1953. \$ 35,000
5. *Manufacturing.* To conduct a sample survey of manufacturing for 1953, with particular emphasis upon firms in the metal-consuming industries \$400,000
6. *County statistics.* To tabulate county data showing number of establishments, total employment and first quarter payrolls in 1953, based upon reports filed by employers in connection with the Old-Age and Survivors Insurance Program. \$130,000
7. *Agricultural statistics.* To provide agricultural statistics for two States based on sample surveys, to test procedures whereby such data can be used by the Department of Agriculture in strengthening their current statistics, and to carry on necessary preparatory work for a broader spot check program in agriculture in October 1954. \$200,000
8. *Reserve to supplement Items 1 to 7 as required, or to meet other needs of government and business, as for example in connection with inventories of certain types of durable consumers' goods or in certain phases of construction.* \$105,000

##### II. Current Program

1953 appropriation	\$6,810,935
1954 appropriation	6,770,000

Although there is only a slight reduction in the appropriation for the current program in fiscal 1954, the program is sharply affected by the elimination of funds for the economic censuses and by the heavy reduction in funds transferred from other agencies, particularly from the National Production Authority. Under Civil Service regulations and the exercise of "bumping" rights, many employees who have been working on the current program have been displaced by employees previously engaged on preparatory work for the censuses or on jobs financed by working funds. In the Foreign Trade Statistics Division, for example, the necessary reshuffling of personnel throughout the Bureau has resulted in the displacement of nearly half the staff from their original positions in order to provide for career employees forced out of other divisions.

As a result of these changes a substantial amount of retraining is necessary, and publication of many Census Bureau reports

will be slowed for a number of months. Some temporary program curtailments have been introduced and all possible measures are being taken to expedite tabulation and preparation for publication, in order to restore the time schedule of all Census Bureau reports at the earliest possible date.

Another change in the current program for fiscal 1954 is a reduction in the amount spent on current industrial statistics. As a result of careful analysis of each of the 66 current surveys in the manufacturing field, a number of changes have been made, such as change in frequency for a few of the surveys from quarterly or monthly to annual, some reduction in the amount of product or geographic detail, etc. Also, in some instances the industries affected will supply supplemental funds to the Census Bureau so that particular reports may be continued unchanged.

#### DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

##### *Public Health Service*

##### National Office of Vital Statistics

1953 appropriation .....	\$1,056,900
1954 appropriation .....	1,135,000

An increase of \$125,000 was requested for the National Office of Vital Statistics for fiscal 1954 to enable the office to overcome the time lag in the publication of its reports. The time lag has resulted from successive small decreases in appropriations, coupled with an increase in the number of reports to be processed and tabulated. As a result of the reduction of the increase from \$125,000 to \$78,000, and of a limitation on personal services contained in the appropriation item which includes the National Office of Vital Statistics, progress in reducing the time lag in the publication of vital statistics reports will be less than had been anticipated.

Emphasis during 1954 will be on repairing the time lag for the annual cycle of reports. The annual report for 1951 will be completed by June 1954, still twelve months behind schedule. Processing for the 1952 report will be advanced by about three months, however, so that it will go to press in March 1955, about nine months late. In order to accomplish this advance in the publication of the annual reports, the annual data for 1951 and 1952 will be reduced in scope: all birth statistics will be based on a 50 percent sample of the registrations, and statistics of births and deaths for both years will not be tabulated by residence below the county level. Also, the remaining work on Census-related reports, including the study of mortality by occupation and the United States life tables for the 1950 Census period, will be further deferred.

#### DEPARTMENT OF LABOR

##### *Bureau of Labor Statistics*

1953 appropriation .....	\$5,495,000
1954 appropriation .....	5,345,000

In addition to its regular appropriation for fiscal year 1953, the Bureau of Labor Statistics received \$134,000 for activities financed in fiscal 1953 by allocations from Defense Production Act funds, and a supplemental appropriation of \$150,000 for the 6-month continuation of the old Consumer Price Index, January-June 1953. For 1954 the revised Budget request included increases for (1) rebasing the estimates of housing starts on results of the 1950 Census; (2) a limited survey of consumer expenditures to check current expenditure patterns against those on which the Consumer Price Index is based; and (3) manpower studies which were financed in fiscal 1953 by allocations from Defense Production Act funds. The final appropriation for 1954 approved the increase requested for rebasing the housing starts series, but reduced the total BLS appropriation below the appropriation for fiscal 1953. Funds for activities which had previously been financed by Defense Production Act allocations were specifically disapproved.

Changes in the Bureau of Labor Statistics program for fiscal 1954 are described by subject-matter area in the following paragraphs.

*Manpower studies and employment statistics.* The impact of the reduction in this area will fall largely on manpower studies. Occupational outlook studies will be reduced, and no attempt will be made to maintain currency on occupations contained in the Occupational Outlook Handbook. Manpower studies relating to military and defense work, including those on critical occupations, will be curtailed. No major changes will be made in the employment, hours and earnings field.

*Wages and industrial relations.* The number of community wage studies will be reduced from 20 to 17, and at least one nationwide industry wage study will be eliminated. Union wage scales for the baking industry will not be continued, and the number of cities covered in other union wage studies will be reduced from 77 to approximately 52. The scope of the monthly report on current wage developments will be curtailed, largely by restricting the listings to settlements involving 1,000 or more workers. Analytical work in the industrial relations field will be reduced with reference to analysis of work stoppages and in industrial relations studies. The BLS will undertake an exploratory study of definitions, concepts, and problems of measurement of remuneration and benefits supplemental to basic wages, but field studies of actual employer expenditures on "fringe benefits" cannot be undertaken during fiscal 1954 on the Bureau's regular budget.

*Prices and cost of living.* In the absence of specific Congressional approval for funds for a sample survey of changes in consumer purchases in 3 cities, the BLS is designing a type of consumer study which will provide prompt information on selected operating problems needed to keep the Consumer Price Index up to date, such as the type of outlet in the present sample, influence of discount houses on prices, relative importance of purchases of specific products, consumer acceptance of new products, and the like. Dealer-to-contractor prices of building materials in 5 cities will be discontinued. Other price work will continue as at present.

*Productivity and technological developments.* All industry studies of man-hour requirements based on plant visits and primary data will be discontinued. Emphasis will be placed on the manufacturing series from data from secondary sources, based on physical production and gross national product for manufacturing. Industry indexes will be prepared and released as components of the over-all indexes for only a limited number of industries.

*Construction statistics.* As in fiscal 1953, the program will be confined to the monthly series on new housing starts, urban building authorized, and estimated total expenditures for construction. Rebasing of the housing starts series on 1950 Census information, for which the Congress allowed an increase of \$95,000, is expected to be completed by June 30, 1954, at which time estimates on the new basis, linked to the old series, will be available. In carrying out this project, BLS will consult extensively with advisory committees of government, industry and labor. Essentially the project embraces: revision of the stratification and the weighting procedures for the building-permit-derived section of the estimate; revision of the sample of 96 counties currently surveyed to measure starts in nonpermit places; identification and establishment of regular reporting from local government units that have recently established permit systems; and new surveys of rates of permit cancellation and time elapsed between issuance of permit and start of construction, and the relationship between permit valuation and construction cost.

*Other programs.* BLS will direct its attention to meeting increasing demands from the States for cooperative State-Federal

injury-rate surveys, but will reduce the detail available in studies of accident causes. "Notes on Labor Abroad" will be discontinued, although the substance of major issues covered by the publication will be included in the Monthly Labor Review.

#### HOUSING AND HOME FINANCE AGENCY

Office of the Administrator

Housing Research Program

1953 appropriation.....	\$528,000
1954 appropriation.....	125,000

The Housing Research Program was established under Title III of the Housing Act of 1949. In fiscal years 1950 and 1951, about \$2,200,000 in research contracts under this program were let with other Government agencies, educational institutions, and scientific research organizations—about \$1,200,000 for technical research and about \$1,000,000 for research in the fields of housing economics, finance, and urban development. No new contracts were made in fiscal years 1952 and 1953. The appropriation request for 1954 included an increase to expedite staff research in evaluating and disseminating the results of previous contract investigations now being completed, and for limited resumption of research contracts.

The final appropriation for 1954 denied all continuing operating funds for the Housing Research Program, and provided an amount not to exceed \$125,000 for liquidation of the research program no later than April 30, 1954. Accordingly the staff engaged on the program has been reduced from 65 as of June 30 to about 20. Remaining staff members are engaged primarily in preparing for publication such of the contract research results as may be completed within the limitations of funds and time available.

#### Termination of Interindustry Economics Research Program

The Interindustry Economics Research Program is being discontinued as a large-scale interagency activity. It came into being as a result of the recommendations of a committee of experts convened by the National Security Resources Board in 1948, at the request of the Munitions Board. The program was financed initially by a grant from the NSRB, and continued primarily with funds from the Department of Defense.

Most of the statistical agencies of the Federal Government participated in the preparation of the large amount of data required for the interindustry approach and for application of the technique to studies of manpower mobilization. Contracts were also made with a number of universities for specific research tasks, both in technique and in preparation of data, concerned with interindustry analysis and problems of manpower mobilization. Responsibility for monitoring the coordinated research programs on interindustry economics and manpower was assigned to the Office of Statistical Standards, Bureau of the Budget, under contract with the Department of Defense.

The decision to terminate the Budget Bureau's responsibility for planning research projects and monitoring the interagency agreements and university contracts was made by the Director of the Bureau of the Budget in May. The decision to terminate active participation of the staff of the Department of Defense in the program, and the financial support of the Department of Defense for work on the project being carried out by other agencies and universities, was made by the Deputy Secretary of Defense late in July.

As a result of these decisions, the specialized staffs of the agencies working on interindustry projects are being disbanded, and research will be terminated in the next few months. Activi-

ties at present center around orderly termination of the program, including documentation of research, indexing of data, and completion of units of data useful as independent compilations.

PEYTON STAPP,

Assistant Chief, Office of Statistical Standards,  
Bureau of the Budget

#### "Occupational Mobility of Scientists"

The mobility of scientific personnel—with respect to occupational specialty, function, type of employer, and geographic area—is analyzed in a study conducted by the Bureau of Labor Statistics in cooperation with the Office of Naval Research. The work histories of 1,122 chemists, biologists, and physicists with Ph.D. degrees, who constituted about 5 percent of the Nation's Ph.D.'s in each of the three fields at the time of the survey (mid-1948), were studied. Results of the study have recently been published in "Occupational Mobility of Scientists," BLS Bulletin No. 1121.

The study indicates that scientists move from one part of the country to another more readily than most other occupational groups. Four out of five of the scientists reporting had held jobs in at least two States, while more than two fifths of them had worked in three or more States. Some other findings are that most of the respondents had shifted from one to another of the activities normally carried on by scientists—teaching, research, technical administration, etc.; that the majority had worked for more than one other type of employer; that over half had at some time transferred from one scientific specialty to another.

Copies of "Occupational Mobility of Scientists" are available, at 35 cents each, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

HELEN WOOD,

Chief, Branch of Occupational Studies, Division of  
Manpower and Employment Statistics, Bureau of  
Labor Statistics

#### Characteristics of Recipients of Aid to the Disabled

The Bureau of Public Assistance, Social Security Administration, has recently issued "Characteristics of Recipients of Aid to the Permanently and Totally Disabled, Mid-1951," as Public Assistance Report No. 22. The report presents tables and highlights from a study of social and medical characteristics of a sample of over 13,000 recipients of aid under the program. It contains tabulations of age, sex, living arrangements, mobility, and diagnosed major impairments for the 30 States operating programs in mid-1951 combined, and by State. A limited number of copies of the report are available without charge. Requests should be made to the Division of Program Statistics and Analysis, Bureau of Public Assistance, Social Security Administration, Washington 25, D. C.

A number of analytical articles dealing with various phases of the findings of the study are being planned for publication in the *Social Security Bulletin*. The first of these articles, "Diseases of the Heart among Recipients of Aid to the Permanently and Totally Disabled," appeared in the July issue, and a study of young recipients is scheduled for publication in the October issue.

THOMAS G. HUTTON,

Bureau of Public Assistance, Social Security Administration, Department of Health, Education and Welfare



## Report on Growth of Scientific Research and Development

The Office of the Assistant Secretary of Defense (Research and Development) has issued an 11-page report presenting a summary of the growth of scientific research and development in the United States from 1941 through 1952. The report divides the economy into three segments—industry, Federal Government, and nonprofit institutions. Data are presented for each of these segments on the amount of research performed, the amount of research paid for, the number of research engineers and scientists employed, and the average cost of research per research engineer and scientist. Special emphasis is placed on 1952 figures.

The trend of research and development has been steadily upward during the past 12 years, increasing from \$900 million in

1941 to \$3,750 million in 1952. Over two thirds of 1952 expenditures for research and development represents work performed by industry, 21 percent work performed in Federal laboratories, and 11 percent work in nonprofit institutions. On the other hand, most of the money spent in 1952 for research and development was supplied by the Federal Government (60 percent), while industry paid for 38 percent and nonprofit institutions for 2 percent.

Copies of "The Growth of Scientific Research and Development" may be obtained from the Office of the Assistant Secretary of Defense (Research and Development), Washington 25, D. C.

LAWRENCE A. STERNBERG,

Resources Division, Office of the Assistant Secretary  
of Defense (Research and Development)

## MARCH 1953 JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION NEEDED BY THE SECRETARY'S OFFICE

The Secretary requests that all members who can spare their copies of the March 1953 issue of the *Journal* send them directly to his office. An unusually large number of requests from overseas libraries for *Journal* subscriptions and the increasing number of new members in the Association has caused the stock of this issue to be depleted. Please send your copy directly to The Secretary, American Statistical Association, 1108 16th Street, N. W., Washington 6, D. C.

## *Books from McGraw-Hill*

### INTRODUCTION TO THE THEORY OF GAMES

By J. C. C. McKINSEY, *Stanford University*. 382 pages, \$6.50  
Deals with the mathematical theory of games of strategy. The mathematical apparatus developed by the author will find application not only in the pure form of parlor games of strategy (chess, bridge, poker, etc.), but also in economics, statistics, and the theory of military strategy.

### THE COMPLEAT STRATEGYST

By JOHN D. WILLIAMS, *Rand Corporation*. Ready in January  
In a light, humorous, and easily readable style, this book covers an elementary explanation to the theory of games and methods for its application to problems involving conflict situations which resemble games. The theory is presented without use of anything higher than secondary school arithmetic, and worked out examples of its application to situations ranging from checker and card games to business problems and military strategy are included.

*Send for copies on approval.*

## McGRAW-HILL BOOK COMPANY, Inc.

330 West 42nd Street

New York 36, N. Y.



# DEVELOPMENTS OF STATISTICAL PROGRAMS IN MID-AMERICAN UNIVERSITIES AND COLLEGES

by

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This report presents a description of the programs in statistics of twenty-one institutions located in the central section of the United States. It collates the information given in response to a number of questions submitted to the institutions dealing with the organization, financing, nature and scope, and the instructional staff of the programs. Each institution was also asked to specify significant changes in its program during the last ten years.

The letter of inquiry was sent to twenty-six institutions of whom twenty-one responded. Returns were received from:

University of Arkansas  
University of Chicago  
Northwestern University  
University of Illinois  
University of Indiana  
Purdue University  
Iowa State College  
University of Iowa  
Kansas State College  
University of Kansas  
Louisiana State University  
Michigan State College  
University of Michigan  
University of Minnesota  
University of Mississippi  
Mississippi State College  
University of Missouri  
Montana State College  
University of Nebraska  
Western Reserve University  
University of Wisconsin

The institutions are classifiable into three types: State Universities, 12; State Colleges (Land-grant), 5; Private Universities, 3.

The answers were summarized separately for the three types. The major questions were:

1. What is the present organization of the statistical program?
2. How is the program financed?

3. What are the nature and scope of the program?
  - a. Undergraduate
  - b. Graduate
  - c. Adult education
  - d. Service and Research facilities
  - e. Number and ranks of staff
  - f. Sequences or separate courses offered
4. What significant changes have taken place during the last decade?

## Organization of the Program

There were three types of organizations of the statistical programs. The distribution of institutions among these types follows:

1. No central organization — each college or department provides its own statistical program:  
12 state universities; 4 state colleges; 2 private universities
2. Separate department of statistics  
1 private university; 1 state college
3. Centralized in mathematics department  
1 state college

It is noted that 18 of the 21 institutions have decentralized organizations; that is, each college or department provides its own statistical program. Only one private university (Chicago) and one state college (Iowa State) have separate Departments of Statistics. One state college (Michigan State) has its program centralized in the Mathematics Department.

Strictly speaking, the three types of organizations are not discrete. The institutions reporting separate departments or centralization indicated that there are statistical programs or courses or research activities outside these organizations. Likewise there are institutions among those specifying no central organization, in which there are some inter-departmental or institutional arrangements aimed to coordinate certain aspects of the institutional programs. The first hierarchy is at times within the college or department where the organization is designed to centralize or integrate the statistical program within the college or department itself.

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Thus we find a Department of Statistics within Schools of Commerce or Schools of Business; the instructional program in the Department of Mathematics and the research and service program in a central Statistical Laboratory or in the Agricultural Experiment Station. Three state universities reported committees set up to coordinate the institution's graduate program. One committee was set up within the Graduate School. It approves and supervises the master's and doctor's programs, approves graduate courses, appoints committees of the graduate student, and acts in a general advisory capacity to the dean and executive group committee of the Graduate School. In a second institution there is a Division of Statistics whose official function is to supervise the administration of programs for the minor and to serve in an advisory capacity to the administration. The third institution indicated the existence of an advisory committee but did not define further its functions.

One other point seems to be the recency of the organization of the statistical program in many institutions. Thus asked to report when the present organization was established, five institutions gave the years: 1941, 1944, 1946, 1949, 1951. One stated that the antecedents of its present organization began prior to 1920.

### Financing the Program

Correspondingly, the statistical programs are financed largely from departmental budgets; in only three institutions does statistics have its own budget:

1. Departmental budget  
12 state universities; 4 state colleges; 2 private universities
2. Separate budget  
2 state colleges; 1 private university

Here again, it is not: either, or. Three state colleges indicated that there was a departmental budget for teaching only and a separate budget for the laboratory or research program. One state university stated that the Graduate School financed the statistical research laboratory but that the other programs were financed out of departmental budgets. We may state also that the two institutions reporting the most comprehensive instructional and research programs have financial support for some aspects of their program from such outside agencies or sources as BAE, Industrial and Commercial Surveys, Office of Naval Research, and the Rockefeller Foundation of Post-Doctoral Fellowships.

We turn now to the institutional programs which received major consideration in the inventory. The information was at times scanty and ambiguous. On the whole, however, rather complete answers were provided. They were, however, difficult to summarize.

### Nature and Scope of the Statistical Program

*Undergraduate*—Eleven of the institutions offer majors and minors or fields of concentration in statis-

tics leading to the bachelor's degree:

Yes: 5 state universities

4 state colleges

2 private universities

No: 7 state universities

2 state colleges

1 private university

The undergraduate program leading to the bachelor's degree was most often offered in the School of Business or/and in the Department of Mathematics. The University of Michigan indicated that while statistics is not offered as a major or minor for the bachelor's degree, a student may receive a bachelor's degree with a major or minor in mathematics, which includes a number of courses in statistics. Three concentration programs are offered for majors in mathematics: (1) for students in pure mathematics, (2) for students in mathematical statistics, and (3) for students in actuarial mathematics.

Another state university, Illinois, described a new curriculum in statistical economics in which the work is divided into six groupings. One of these groupings represents a somewhat unique grouping: "Here the effort has been to set up subject matter areas (labor—national income-forecasting-managerial control) which are approached on an empirical basis and in which the student is expected to deal with the problems of analysis by employing his background of economics, mathematics and statistical methods. The purpose of this group of courses (statistical economics) is to develop analytical sense in the student and to oblige him to use all relevant tools of analysis, which can be brought to bear in the search for answers to the questions . . ."

There has been some advocacy of a single introductory course (or courses) in statistics to be offered for all students in an institution. This movement has not made much headway in the institutions surveyed:

1. A single introductory course for all students

No: 11 state universities

4 state colleges

2 private universities

Yes: 1 state university

2 state colleges

1 private university

Only four institutions indicated the existence of such a course or courses. Purdue specified that the several departments taught their own introductory course but integration was attempted through a general course of study. Chicago said that a single introductory course was provided for students in the social sciences and another course for students in the sciences. One of the institutions (Michigan State College) that had offered a single course planned to segregate the business students in a separate section. The University of Missouri stated that an introductory course offered in the School

of Business was open to all students of the university. Perhaps the University of Michigan should have been placed in the "yes" rather than "no" category. It stated that a course in mathematical statistics with only college algebra as a prerequisite often serves as a general service course in statistics.

There are also proponents for a new kind of elementary course which is primarily designed for general education rather than for special education purposes. Some small beginning along this line is discernible:

1. Any elementary course offered for general rather than special education:

No: 10 state universities

4 state colleges

2 private universities

Yes: 2 state universities

2 state colleges

1 private university

Wisconsin, one of the five institutions offering such a course, stated that the enrollment in the course was less than one per cent of the total enrollment in eight introductory courses. The University of Chicago indicated that a general education course was offered for students in the social sciences. Illinois reported that a first course in mathematical statistics and one in general applied statistics offered in the economics department were regarded as general education courses.

*Graduate* — We present first the following data concerning the graduate program:

1. Master's degree granted with a major in statistics

Yes: 6 state universities

4 state colleges

2 private universities

No: 6 state universities

2 state colleges

1 private university

a. Number of Master's degrees granted during the last five years—

State Universities	State Colleges	Private Universities
1:50	1:10	1:10
1:35	1:14	1: 0
1:10	1: 1	
1: 6	1: 1	

2. Ph.D. degree with a major in statistics

No: 7 state universities

3 state colleges

2 private universities

Yes: 5 state universities

3 state colleges

1 private university

a. Number of Ph.D. degrees granted during last five years—

State Universities	State Colleges	Private Universities
1:6	1:9	1:0
1:1	1:5	
1:1	1:0	

Graduate work in statistics both for the Master's and the Ph.D. degree is apparently of recent development at the institutions: 12 offer the Master's degree while only 9 grant the Ph.D. degree. Only 6 institutions reported the date of establishing the Master's degree: 1 in the late 1920's; 3 in 1947; 1 in 1949, and 1 in 1950. Four institutions indicated the year in which the Ph.D. degree was established: 1 in 1940, 1 in 1944, 1 in 1949, and 1 in 1951. A total of 147 Master's degrees were reported as granted during the last five years while only 23 Ph.D. degrees were granted during the same period.

In certain institutions where majors in statistics are not offered for the Ph.D. degree, one or more courses, elementary and/or advanced, were required in some fields when a Ph.D. program was offered. At three institutions also, it was possible to offer statistics as a tool to replace one of the foreign languages required for the doctor's degree. In such cases statistics as a research technique must not be customarily required of students in the department under consideration.

Only a few institutions provided adequate descriptions of their graduate programs.

The description of a program for the Master's degree at the University of Missouri follows:

Two Master's degrees are offered, the Master of Science in Statistics, and the Master of Arts in Statistics. The requirements for the Master of Science degree are:

1. A minimum of 16 semester hours of course work in statistics.
2. A minimum of 10 semester hours in some related field (a minor).
3. Six semester hours of electives; no thesis is required.

The requirements for the Master of Arts degree are:

1. A minimum of 16 semester hours of course work in statistics.
2. Present satisfactory evidence of having completed Calculus II, or its equivalent, or include this course as a part of the program of work for this degree.
3. Sufficient electives to constitute a coherent program. No minor is required or expected. No thesis is required but the student who chooses to present one may count it as 6-8 hours of credit in statistics (course No. 490) as a part of the program of work for the M.A. degree.

The description of the program for the Ph.D. degree at the University of Minnesota follows:

*Major* — The course work for the major should normally be chosen from the courses listed (10 graduate

courses in mathematics and 22 graduate courses in statistics are listed), including additions to this list made in the future by the committee on statistics. The minimum requirements include advanced calculus (6 credits) and Mathematical Theory of Statistics (9 credits).

*Minor*—The minor program should normally be chosen from a subject matter field in which the candidate expects to apply his statistical theory.

*Approval of program*—The candidate's tentative program is formulated with the aid of the adviser selected from the graduate school committee on statistics, who is most closely associated with the subject matter field in which the minor work is done. This program is first presented to the committee on statistics for evaluation and recommendation; and this committee then recommends a thesis committee for the candidate. These recommendations are then referred to the Graduate School.

*Language requirement*—A reading knowledge of two foreign languages or a reading knowledge of one foreign language and a special research technique will satisfy this requirement.

A student whose major for the Ph.D. degree is some field other than statistics and who looks forward to research requiring statistical techniques may take a minor in statistics. The minor program is worked out in consultation with an adviser from the committee on statistics.

Kansas State College reported the following requirement for a master's degree: "We require a 10 hour minor, and a total of 32 semester hours including a master's report (2 credits). The other 20 hours for the major include:

Mathematical statistics I and II	6 hours
Advanced Calculus I	3 hours

In addition 11 hours from:

Probability (3), statistical methods I and II (3) hours each, Sampling Methods, Design of Experiments (3), Quality Control (3), and such graduate mathematics courses as Higher Algebra, Higher Geometry, Complex Variables, Advanced Calculus II, or Advanced Differential Equations."

Iowa State College briefly summarized the requirements for the Ph.D. degree as "108 quarter hours, a qualifying exam, two foreign languages, a thesis, and an oral examination."

We quote at some length the description of both the master's degree program and the Ph.D. degree program of the University of Chicago, the only one of the three private universities granting both of these degrees:

"The master's degree in statistics can be obtained in either the Division of the Physical Sciences or the Division of the Social Sciences. The principal difference between the two is in the field of application of statis-

tics which is required for the degree; if the degree is taken in the social sciences, the field must be in that division. If the degree is in the division of the physical sciences, any field is acceptable. Our requirements for the degree are stated in terms of examinations that must be passed, rather than courses that must be taken. I enclose copies of the catalog announcements for both divisions. You will note that there is outlined a sequence of courses in preparation for these examinations which consist of eight mathematics courses, nine statistics courses and five courses in a related field. The mathematics is four quarters of analysis, three quarters of matrix algebra, and one other. The statistics is a three-quarter course at about the level and content of your book, a three-quarter sequence in mathematical statistics at about the level of Mood, Cramer, or Wilks, one quarter's active participation in the seminar (attendance is more or less expected throughout the program, but not necessarily the presentation of reports) and two other courses."

"The Ph.D. in statistics was established in the fall of 1951. . . . As to special features, we do operate in conjunction with the statistics department a Statistical Research Center, which consults as widely and freely around the campus as our resources permit, and does quite a bit of applied work. . . . Ph.D. students are required to take part in our consultation activities by registering for a course for at least two quarters."

"In addition to the master's and doctor's programs, we have a post-doctoral program. The purpose of this is to educate established research workers in the physical, biological, or social sciences in the field of statistics. These people are paid a rather good stipend, provided with one of the faculty offices, brought into a considerable extent to our consultation activities, and in general treated as colleagues by the faculty, but they are required to attend several courses each quarter and to do all the exercises, examinations, and other assignments in at least two courses."

The University of Illinois reported that the Department of Mathematics of the College of Liberal Arts and Sciences administers the graduate degrees of M.A. and Ph.D. in statistics. In the administration of the graduate degrees, the head of the Department of Mathematics is advised by a university-wide Statistics Advisory Committee appointed by the dean of the Graduate College. Michigan stated that the Ph.D. degree is granted in mathematics with a major in statistics; "very occasionally students in other departments or schools, such as Economics, Public Health, or Education will get an advanced degree in his own department with a minor in statistics, but these programs are usually worked out individually with the Mathematics Department, and in the case of Ph.D. candidates a member of the Mathematics Department is on the candidate's doctoral committee."



*Adult Education*—The rapid development of statistics and the continuous extension of its uses in many fields of application have created pressing needs for people in industry and service. Fourteen of the twenty-one institutions reported attempts to meet some of these needs:

1. Adult education programs for people in service—

- Yes: 9 state universities  
3 state colleges  
2 private universities
- No: 4 state universities  
3 state colleges

A diversity of programs and activities have been used. At least seven institutions mentioned provision for some type of instruction in quality control. Western Reserve, which is located in a large industrial city, has instituted a comprehensive program of courses covering the field of quality control. The instructional staff is drawn from persons with outstanding business as well as educational backgrounds. Classes at a conveniently located downtown center of the university make possible either a full-time college program or a combination of classroom study and on-the-job application for those who are employed. Other institutions have conducted short courses, workshops, institutes, demonstrations, and conferences devoted to giving instruction largely in applications of statistics. Occasionally courses in industrial statistics have been offered as evening courses and even correspondence courses. Some institutions have offered special lectures on applications of statistics. One institution offers special courses in statistics to the Air Force. This same institution also set up ten intensive "Management Training Conferences" in which statistics played a significant role.

*Service and Research*—The service and research facilities on an institutional wide basis seem to be rather limited:

1. Center for consultation on problems in statistics arising in research in the various colleges or departments of the institution—

- No: 8 state universities  
3 state colleges  
1 private universities
- Yes: 4 state universities  
3 state colleges  
1 private university

2. Provision for central laboratory and calculation facilities—

- No: 8 state universities  
1 state college  
1 private university
- Yes: 4 state universities  
5 state colleges  
2 private universities

The nature of the consultation and calculation facilities where established on an institutional basis is only briefly described in most cases.

Wisconsin reports that two members of the staff are available for consulting on statistical problems in research, one a three-fourths time consultant in the Agricultural Experiment Station and the other in connection with three-fourths time allotted to the computing service. A small computational laboratory is available in the office of the first consultant. The computing service is available for any calculations connected with research. Another state university reporting institutional service stated that there is a statistics laboratory under a director, but that there is no separate budget and that any advice given is free. A third state university reported that there is a Statistical Research Laboratory under the auspices of the Graduate School, which has just been set up (1951) on a minimum scale. A fourth state university stated that a computing room is available to all persons who care to use it; also, that the Department of Mathematics contains a statistical research laboratory especially intended to provide consultation on problems in statistics arising in research in various departments and colleges of the university.

Three of the six state colleges reported central consultation and calculation facilities. In one the Statistical Laboratory was established about twenty years ago. From this laboratory statistical advice is given to persons working on research projects in the Agricultural Experiment Station, to graduate students working on theses, and to other persons and agencies both on and off campus. Connected with the laboratory is a staff engaged in basic research emphasizing both the development and extension of basic theory and its application in the development of new statistical tools and techniques. The research aspects have been greatly expanded under a number of cooperative agreements set up with governmental agencies. The laboratory offers the service of a technical staff for computation and analyses and is equipped with the necessary facilities including IBM installations. Two other state colleges reported staff and facilities for consultation and statistical service including calculation to all the departments of the institution. One college reported no provision for a center for consultation except for departments connected with the Agricultural Experiment Station with one man available on a three-quarter's time basis. In this institution there is no provision for central laboratory and calculation facilities.

One of the private universities reported provision for a central laboratory and calculation facilities but no central consultation service. A second reported that the laboratory in the commerce department might be

used by all members of the university. The third institution reported both types of programs. A Statistical Research Center serves other parts of the university by providing advice and finding statistical assistants for them. There is a central statistical laboratory established twenty to twenty-five years ago under a special grant for that purpose. The laboratory contains a small working library of tables, reference texts, and principal periodicals, and there are attendants on duty to give instruction in the operation of the machines.

*Staff Members*—The number of staff members who give all or the major part of their time to the statistical program as reported by 18 of the 21 institutions are listed in Table I below.

The total number ranged from 3 to 28 in the 9 state universities reporting, from 1 to 26 in the state colleges, and from 6 to 11 in the private universities.

*Courses in Statistics*—The sequences or separate courses reported were as follows:

1. State Universities (9 reporting): 62, 44, 29, 28, 28, 12, 11, 10, 5

2. State Colleges (4 reporting): 47, 19, 17, 8

3. Private universities (2 reporting): 23, 18

The number of courses, obviously, varies considerably depending upon the comprehensiveness of the statistical program.

An illustration of the rapid development of theoretical and applied statistics is given by the offerings in the separate Department of Statistics at Iowa State College

1, 2 Principles of statistics—Cr. 3 each

3 Elementary Business Statistics—Cr. 3

4, 5 Introduction to Theory of Statistics—Cr. 3 each

6, 7 Statistical Methods for Research Workers—Cr. 4 each

8 Experimental Designs for Research Workers—Cr. 3

9 Survey Designs for Research Workers—Cr. 3

10 Elementary Statistical Quality Control—Cr. 3

11 Economic Statistics—Cr. 3

12, 13, 14 Statistical Theory for Research Workers

15, 16 Processing of Data—Cr. 2 each

17 Special Problems—Cr. as arr.

18 Statistical Methods—Cr. 3

19, 20 Design of Experiments I—Cr. 3

21 Design of Surveys—Cr. 3

22 Elementary Theory of Sampling—Cr. 3

23 Industrial Statistics: Sampling Inspection—Cr. 3

24 Industrial Statistics: Design of Experiments—Cr. 3

25 Biological Statistics—Cr. 3

26 Genetic Statistics—Cr. 3

27 Elementary Econometric Statistics—Cr. 3

28, 29, 30 Theory of Statistics—Cr. 3

31 Special Topics—Cr. as arr.

32 Seminar on Statistical Methods—Cr. as arr.

33, 34 Design of Experiments II—Cr. 3 each

35, 36 Probability—Cr. 2 each

37 Seminar on Design of Surveys—Cr. as arr.

38 Advanced Theory of Sampling—Cr. 3

39 Advanced Econometric Statistics—Cr. 3

40, 41, 42 Advanced Theory of Statistics—Cr. 3

(40) General Theory of Linear Hypotheses

(41) Distribution Theory

(42) Theory of Estimation and Testing of Hypotheses

43 Time Series

44 Multivariate Analysis—Cr. 3

45 Sequential Analysis

46 Seminar on the Theory of Statistics—Cr. as arr.

47 Research—Cr. as arr.

We list also the statistical courses of the separate Department of Statistics at Chicago where both the master's and Ph.D. degree are granted. In addition, various other departments have their own statistical programs. The courses of instruction are:

1. Introduction to Statistics

TABLE I

	State Universities									State Colleges						Private Universities		
Professors.....	5¼	8	7	3	2	6	2	2	1	6	2	1		1	1	1	1	1
Associate Professors.....	1	2		1	1	1	3		1	3				1		3		
Assistant Professors.....	3	3	2	2	2	1	2	1	1	4	4	2		2		8	1	1
Lecturer.....	3															1		4
Statistician.....	1																	
Instructor.....	3		4	1	2			3½		7				1		3		
Research or Grad. Ass't.....	8	9	5	3	2					6	4	3				1		
Rank not specified.....	4										7-10		5½					
Total.....	28¼	22	18	10	9	8	7	6½	3	26	17-20	6	5½	5	1	11	8	6

2. Statistical Inference I
3. Statistical Inference II
4. Statistical Inference III
5. Introduction to Mathematical Probability
6. Limit Theorems of Probability Theory
7. Markov Processes
8. Sample Surveys
9. Time Series
10. Mathematical Statistics I
11. Mathematical Statistics II
12. Analysis of Variance and Regression
13. Estimation and Tests of Hypotheses
14. Theory of Minimum Risk
15. Statistical Problems of Model Construction
16. Sequential Analysis
17. Non-Parametric Inference
18. Multivariate Analysis
19. The Design of Experiments
20. Statistics Seminar
21. Master's Thesis
22. Consultation
23. Readings in Statistics

*Significant Changes*—The recency of the development of statistical programs in most institutions is reflected in the responses made in request to a report of significant changes that have taken place during the last decade. Excerpts from these responses follow:

1. State universities (seven reporting)

*Missouri:*

"Ten years ago the statistics staff in the Department of Accounting and Statistics consisted of one full-time man. Now it consists of four full-time men and one half-time man. Last year there were five full-time statistics staff members. Ten years ago there was no special degree in statistics, either graduate or undergraduate, and no area of concentration involving statistics. Roughly the number of courses in statistics in the Department of Accounting and Statistics has doubled during the last ten years. The enrollment has increased considerably more."

*Minnesota:*

"The graduate program in statistics has been developed since 1944."

*Kansas:*

"The statistical program has been changed significantly during the last decade by the additions of courses and staff. Not only are there more instructors teaching statistics than before, but they are better trained in the modern development in statistics."

*Arkansas:*

"Two significant changes have occurred:

1. The statistical activities of the Bureau

of Business and Economic Research have been about tripled.

2. The Institute of Science and Technology has increased somewhat its statistical research."

*Indiana:*

"During the last decade there has been an increase in the offerings in the statistics area by the Department of Economics and an increase in new offerings by Sociology and Psychology and the School of Education."

*Illinois:*

"All the degrees . . . have been established since June, 1950. Prior to that time there were no graduate degrees in statistics at our University, although people could major in statistics while taking some other degree in various parts of the University, including mathematics. In 1944-1945 the program in statistics in this Department consisted of a course in probability, an advanced undergraduate year course in statistics, and a graduate course also of a year's length in statistics. This program had not changed much during the years since 1940. The major changes in our statistics program have taken place since February 1949, although they began two years earlier. We regard the program in statistics in this college and in the University as being still in process of development."

*Michigan:*

"There has been an amplification of the statistical program in all departments and schools of the University. In addition, the Statistical Research Laboratory was established in 1946."

2. State Colleges (six reporting)

*Purdue:*

"Most of the developments and programs have taken place during the last decade."

*Montana:*

"We consider the last decade has shown a decided growth of needs in statistics and a definite attempt should be made to correlate the work but not necessarily create a separate department as it has not been demonstrated that it should be more effectively handled that way."

*Iowa:*

"Department of Statistics was established during the last decade."

*Mississippi:*

"Greatly increased emphasis on statistics: at least one course in statistics is required of all students."

*Michigan:*

"In the past five years, the teaching program has been completely revised in the light of modern developments in the field. Prior to that time, even the Neyman-Pearson theory was not taught. Our research activities have not kept pace; there is no organized research activity on the campus."

*Kansas:*

"It is only in last decade, essentially, that there has been a statistical program. Prior to 1940, four elementary courses were taught. All were elementary and overlapping. There was no work or consultation in the field of experimental statistics."

3. Private Universities (three reporting)

*Western Reserve:*

"Our present organization was established two years ago."

*Northwestern:*

"The most important change is a realization that statistics should be taught as a tool subject in commerce, the social sciences, education, biology, and so forth. Courses in mathematical theory of statistics are not helpful from this point of view."

*Chicago:*

"In recognition of these developments (in the modern science of statistics) the University in 1949 established a Committee on Statistics, for the purpose of:

1. Research in the theory and application of statistics.
2. Instruction in statistics at levels extending from introductory courses contributing to general education through the provision of facilities for post-doctoral research.
3. Consultation on the statistical aspects of research throughout the University.
4. Provision of facilities for research, study, and application of statistics, which includes machines and laboratory equipment, essential library facilities, seminars, and lectures by distinguished visiting statisticians."

### **Some Implications of the Findings**

Because of the dynamic character and the all pervasiveness of statistics we find that statistical programs are taking on different forms in different institutions. It is likely a good thing for the subject that there are experiment and variation in the methods of handling institutional programs. Surely there is no one method which has been established as the best nor is there likely to be a single one. A statement made by one

of the respondents for his institution may also be apropos here: "I believe it is true here particularly and probably true at other institutions as well that the attitudes and performance of the men in the institution who are interested in statistics are far more important than any organizational scheme."

While it is likely desirable for each institution to develop its own program to meet its own needs, there seem to be a number of criteria emerging which could lead to more effective programs if critically applied.

The institutions reporting on the whole indicate a pressing need for instruction in statistical methods as tools ancillary to many fields and subjects. This need of the scientist, both natural and social, to become his own statistician is the need which all the institutions of this study have attempted to meet in various ways. The need for the training of practitioners will likely be a continuous one. The training of the practitioner in the use of statistical methods in his every day work carries with it also his recognition of the need for consulting the professional statistician on the statistical problems he is unqualified to handle.

The need for statistical programs that can provide the appropriate training of professional statisticians is indeed urgent as we note the increasing numbers required by governmental agencies, universities, and industry. It would appear from the descriptions of the statistical programs afforded by the institutions that very few are providing the programs required for the training of professional statisticians at the highest level. That the institutions are aware of their inadequacies is indicated by the relatively few that grant the Ph.D. degree. Perhaps the need for this training can be met by a few institutions with strong programs and facilities. On the other hand, there may be a close relationship between the quality and efficiency of the other aspects of the statistical program of the institution and the quality and amount of the graduate work offered in statistics.

In addition to the programs required to meet the needs for training the practitioner and the professional statistician, there is another need emerging which is apparently receiving only meagre attention by the institutions. Not only is statistics a science and an applied science but it is also a public science. The citizen in a democracy needs to have more and more the statistical viewpoint of looking at every day problems—economic, political, and others. An introduction to the concepts of elementary statistical reasoning and the development of an appreciation and understanding of the role of statistics in science and in every day life should likely constitute an essential part of the general education of every college student. Only four of the nineteen institutions had introduced courses designed for this purpose.



A consequence of the newness of the statistical programs of the institutions is that most former graduates now at work in numerous fields received little, if any, formal statistical training. Many are now finding an urgent need for it in their work. This is also the case for many other workers who are not college graduates. Industry and government are likewise urgently calling for access to various types of programs of value to the adult worker. While a number of institutions are attempting to provide some types of adult education programs, others have done little or nothing. The demand for these programs is not likely to abate.

The role of the statistical consultant in the planning of statistical investigations is now quite generally emphasized. Apparently one of the big gaps in the statis-

tical programs developed by the institutions reporting is the lack of facilities for expert consultation on problems arising in planning and analyzing statistical investigations. Only eight of the nineteen institutions provide such facilities. Coordinate with this need is that of central laboratory and calculation facilities. Approximately half of the institutions have such facilities available.

For the development of programs designed to meet the needs of the present and of the future, it would be highly advantageous, it seems, if all the institutional resources are to be utilized to the best advantage, that much more cooperation and coordination than now exist should be brought to bear on the solution of the institutional problems.

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Interested in application of statistics to  
problems related to the operation of  
chemical plants in the field of

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BS or MS Degree plus statistics

0-8 years experience

send resume to:

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**REQUIREMENTS:** Training in statistical and quality control techniques as well as proven leadership and supervisory ability. Quality control experience desirable but not absolutely necessary.

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# PRODUCTION OF VITAL STATISTICS AS A COMBINED FEDERAL-STATE OPERATION

by

O. K. SAGEN

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The national vital statistics of birth, death, marriage, and divorce are a combined federal-state-local government operation, whereby the Federal Government depends on the state and local governments for basic data. Since 1933, every state has furnished transcripts of its individual birth and death certificates to the Federal Government under an arrangement whereby the Federal Government pays the transcribing costs.<sup>1</sup> The National Office of Vital Statistics codes these data, punches cards, and machine tabulates its various tables on natality and mortality.

National statistics of marriage and divorce are less fully developed. They are compiled from tabulations furnished voluntarily by certain states and from totals reported by the Clerks of Court who issue marriage licenses. Statistics on marriage and divorce characteristics are of necessity limited to those states that have centralized marriage and divorce records and statistics.

While the states have the power to compel reporting of vital events according to law, the Federal Government has no corresponding authority for compelling the states to report their data for national statistics. However, almost every state has a provision in its statutes which commands the State Registrar to furnish vital data for national statistics. Registration of vital events is done under the general police power reserved to the States by the Federal constitution. Therefore, Congress has legislated on vital statistics only to the extent of authorizing the collection and publication of national statistics and has appropriated funds for obtaining data under the arrangements just described. The fact that the United States does produce a high quality of national vital statistics on births and deaths is eloquent testimony to the effectiveness of co-operative arrangements based on good will.

Great progress in improving the quality and completeness of national birth and death statistics has been made ever since the goal of getting every state into the

national reporting system was attained in 1933. One indication of progress is the fact that our national statistics of birth are now based on 98% complete reporting of births, as revealed by the test made in connection with the 1950 U. S. Census.<sup>2</sup> A similar test in 1940 showed only 92% completeness. Equally important is the improvement in consistency of reporting all along the line.

This progress is largely the fruit of rather frequent conferences among the state and territorial registrars under the sponsorship of the Federal Government. These conferences, on an *ad hoc* basis at first, have now developed into a permanent quasi-official organization known as the Public Health Conference on Records and Statistics.<sup>3</sup> The Conference holds periodic meetings in Washington attended by official representatives of the vital statistics interest in every state. Between these periodic meetings, there are regional meetings which feed ideas and problems into the general meeting. Because of the fact that birth and death registration is a State Health Department function, the Conference also works on the problems of integrating vital statistics into the total health statistics picture. A parallel organization of State Registrars, known as the American Association of Registration Executives, devotes itself largely to the legal and administrative aspects of vital records management. These are the mechanisms whereby State-Federal cooperation is being developed by a democratic idea-interchange. A similar scheme has been adopted by Canada with similar success.

Recent developments have led to a re-examination and review of our national vital statistics system. Despite the progress in improving all aspects of the system, it is recognized that the system is far from being fully coordinated. The criticisms leveled by the

\* Paper presented at the 111th Annual Meeting of the A.S.A.

<sup>1</sup> The Federal Government began the annual collection of death transcripts in 1900 and of birth transcripts in 1915. All states were not covered until 1933.

<sup>2</sup> Shapiro and Schachter: *Birth Registration Completeness, United States, 1950*. Public Health Reports, Vol. 67, p. 513-524 (June, 1952).

<sup>3</sup> Public Health Conference on Records and Statistics: *Records at Work, 1950-51*. Document No. 180, Washington, D. C., (March, 1952).

Commission on Vital Records<sup>4</sup> in 1942 are still pertinent. Users of national vital statistics are perturbed over the fact that publication is not timely enough and that certain types of needed statistics are not gathered. For example, for studies of fertility, demographers require more information on natality than is now available in the official birth statistics.<sup>5</sup> These things, together with considerations of economy, have focused attention on the possibility of eliminating duplications between the state vital statistics offices and the National Office of Vital Statistics. The thought is that economies may be obtained by adjusting the division of work that goes into national statistics.

In considering the problem of redistributing portions of the vital statistics effort, there needs to be agreement on the principles which ought to govern the production of vital statistics. Recently a set of ten such basic principles was formulated by an advisory committee.<sup>6</sup> The principles are:

- 1) Each vital event must be uniformly defined and the definition uniformly applied and interpreted.
- 2) Consistency (and comparability) of a determined minimum of data must be obtained and preserved.
- 3) All geographic areas must be included.
- 4) Vital statistics must be timely. This refers to both collection and presentation.
- 5) Periodic measurement of completeness and accuracy of reporting is essential.
- 6) Measurement and control of the accuracy of processing is essential.
- 7) The statistical program must be planned and scheduled well in advance.
- 8) Flexibility and adaptability in procedures are essential to meet unanticipated needs.
- 9) Vital statistics data should be produced with the lowest total expenditure compatible with serving the needs of the public.
- 10) Application of principles depends upon federal-state-local cooperation in the consideration of mutual problems.

<sup>4</sup> 78th Congress: House Document 242, First Session.

<sup>5</sup> U. S. National Committee on Vital and Health Statistics: *Statistics Needed Concerning Fertility*, National Office of Vital Statistics, Selected Studies, Vol. 33, No. 11.

<sup>6</sup> Advisory Committee on Vital Statistics Methods, National Office of Vital Statistics: *Principles for Production of Vital Statistics*, December 11, 1951.

For the most part, the current methods of producing national vital statistics offer pretty good approximations to the sort of ideal performance called for by the enumerated principles. Before we make any adjustments in the way things are now done, we must assure ourselves in advance that the adjusted methods will do at least as well as those they replace and, at the same time, offer good promise of doing better.

Limited experimentation has been under way so as to explore the possibilities of extending federal-state cooperation in producing national statistics. The State of Illinois undertook the guinea pig role in this by modifying its birth statistics procedures so as to produce punch cards in the state office which would be acceptable for national statistics. These modifications entailed a detailed study of the coding procedures and coding conventions to determine where state procedures had to be changed to suit the national needs and policies. Also, certain changes in punched card design were found necessary. The first test was on the Illinois January, 1950 births. Upon receiving these punched cards the National Office of Vital Statistics checked the file by comparing it card for card with the file punched in the National Office from microfilm transcripts of the Illinois certificates. The comparison revealed good agreement on the whole, but certain systematic discrepancies indicated the need for further modifications in the state office procedure.

The experiment was repeated with January, 1951 births. The results indicated that the National Office could accept and use the State's punched cards, provided that controls through card verification were maintained. Accordingly, it was agreed that for 1952, Illinois punch cards would be used for national statistics, subject to key verification of the cards from microfilm transcripts submitted by the State. Additional states have been invited to participate in this scheme. Four states are expected to submit punch cards on their 1953 births.

From the experience gained so far we can be assured that there will be no impairment in the quality of national vital statistics by utilizing state produced punched cards as long as the means exist for making a regular quality check. The states now microfilm their vital records as a protective measure for records preservation. A film print of the entire microfilm costs less than one-half cent per image and offers a very inexpensive way of providing transcripts. The initial plans are for one hundred per cent verification. After the scheme is well established as evidenced by a level of error that is consistently acceptable, the quality check will be maintained by sample verification.

A skeptic may well question how much good will come from having only a few out of the forty-eight states participate in this approach to processing. In

1950 there were 3,554,000 births in the United States, of which fifty-one per cent were recorded in ten states. It is the larger states that are in the best position to undertake the project because of their existing resources in personnel and equipment. Applicability of the scheme is patently dependent on a well developed statistical office utilizing punched card equipment in each participating state. It is also obvious that, under the scheme, a state ought to have a sizeable volume of births, say 50,000 annually. It remains highly questionable as to whether any worthwhile national arrangement can be made to reduce costs of processing data from states having a small volume of births.

Consideration is also being given to a plan whereby the states may submit tabulations to be combined by the National Office of Vital Statistics for national statistics. The use of pretabulated data introduce problems of quality control and processing considerably beyond those of the punched card reporting method. A study of the possibilities and problems of pretabulation is to be undertaken by the State of Oregon in cooperation with the National Office of Vital Statistics next year.

So far, this new type of combined operation has been discussed in terms of making savings in the total outlay for current national vital statistics. The Illinois experiment demonstrated that increasing the state's responsibility for national statistics also had the effect of putting greater emphasis on improving the quality of the original data. As the states, and in turn the local areas, become better aware of the problems of classifying vital data for national purposes, significant improvements in the quality of data collection can be expected. The Federal government may well find that it should devote more of its attention and resources to this aspect of national vital statistics. Under the current system, the Federal government obtains its data at a very low cost, about four cents per record. The state and local governments together spend upwards of a dollar per record before the transcript reaches the National Office. It is true that birth and death records have a legal purpose and use in addition to their use as sources of statistics. Nevertheless, improving the quality of these records as source documents for statistics does little or nothing for the legal portion of the record.

So far, attention has been confined to modifying the production of birth statistics through increased processing at the state level. In the larger states this procedure may well be applied by the states to its larger cities, such as Chicago, Detroit, Los Angeles, and Philadelphia, to mention a few. New York City, Baltimore, Boston, and New Orleans are independent birth and death registration areas which operate independently of their states. The advantage to the city of this sort of

independence could for the most part be realized by delegation of greater statistical responsibility to the large cities by the states. At the same time, the disadvantages of too many uncoordinated statistical efforts could be avoided.

The first approach to the kind of decentralization here described has been confined to birth statistics, because birth data are simpler than death data. Death statistics are plagued with the very difficult and complicated problem of classifying reports on cause of death in a consistent way. But, apart from the problem of cause classification, death statistics present much the same problem in processing as do births. There is no reason now to believe that we cannot eventually adopt the same approach to national death statistics as for birth statistics.

The essential advantage of greater decentralization in vital statistics processing is to fully utilize the controls over and knowledge of the raw data at the point of collection. Even the present wide variation in state processing methods may not have as much effect on the end results of vital statistics as the area-to-area variation in reporting and collecting the basic data. Processing errors on an item such as birth weight are insignificant compared to differences in reporting as between midwives and hospitals. Fashions in diagnosis by medical practitioners varying from place-to-place and from time-to-time will affect cause of death statistics far more than errors of judgment in coding causes of death. As we look to our statistics for more and more precise knowledge of our health problems, we find an ever increasing need for better reporting at the source. Any new scheme for producing vital statistics ought to take as its fundamental challenge the problem of improving source data.

A year ago Hansen, in a paper before the American Statistical Association, outlined the obligations of an agency like the Census Bureau for maintaining statistical standards.<sup>7</sup> The producers of national vital statistics have parallel obligations "to ascertain the accuracy requirements for the data produced, to use efficient methods for obtaining timely results of the desired accuracy of the results, and to publish results without regard to the policies and decisions that may be affected." National vital statistics have not as yet had as much attention devoted to the accuracy considerations as Hansen's paper indicates is necessary. This is not strange in view of the divided responsibility for vital statistics. However, the new approach to processing birth statistics promises better opportunity for measuring and improving the accuracy of the results, as well as making national statistics more timely.

<sup>7</sup> M. H. Hansen: *Statistical Standards and the Census*, American Statistician, Vol. 6, No. 1 (February, 1952).



# BINARY CODING, HORIZONTAL CARD FIELDS AND THE ELECTRONIC STATISTICAL MACHINE

by

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One of the most interesting recent developments in the field of punch-card methods is the idea of using horizontal card fields instead of vertical card fields. This arrangement is necessary in order to facilitate the use of a binary code and the plan to search a file of cards on one run of the cards through the machine in order to obtain all cards involving a specified code number no matter in which one of the twelve possible card fields this code number is punched.

The need for such a search has arisen in a number of widely separated fields, and it appears as if a number of fields will encounter such a need some day, "for publication has been extended far beyond our present ability to make real use of the record. The summation of human experience is being expanded at a prodigious rate and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of the square-rigged ships."<sup>1</sup>

Chemists are now facing the same problem which confronted statisticians about 70 years ago. Statisticians trying to handle by hand the large volume of data collected in the United States Census of 1880 took over seven years to organize and make available the information obtained. Chemists now working on the "Gmelin Handbuch der anorganischen Chemie" think that it will take ten to twelve years to complete the work and they hope to complete the eighth edition "about 1960". This work is taking so long that many chemists fear and other chemists are convinced that the era of the classical handbook is approaching its end. The parallel is striking. Statisticians in the eighties stated that the next United States Census of 1890 would take more than ten years to organize by hand and another census would have to be started before the information from the previous one could be made available, so some more rapid method of handling the data was imperative. This

situation was called to the attention of some people who set about to invent and develop the Hollerith machines. Now, over half a century later, chemists are turning to the same punch-card machines to solve a similar problem—that of making available the pertinent information quickly, before it is made useless by the passage of time.

The most practical alternative to periodic handbooks is a mechanized information center which can serve as a responsive memory or mechanical brain. Such a system requires a method of coding all chemical formulas and scientific information in a form suitable for punched cards. Then chemists who want to know if anyone has investigated the action of a specified catalyst on the decomposition of ammonia at a certain rate of flow, at a given gas pressure, at a predetermined temperature, and with the addition of a certain diluent gas, can be given the answer quickly.

Similar problems have arisen in other fields. Over a thousand persons are engaged daily in searching United States patent disclosures. If these searches could be made mechanically instead of personally by hand, a great saving of time could be made. The card catalogs of large libraries are getting unwieldy and people cannot find what they want quickly or determine quickly that the library does not contain information on the subject in which they are interested. Hospital records and medical reports in general have not been kept in a form which permits rapid search for all cases involving combinations of certain symptoms. Lawyers could use such a system to locate quickly all cases involving a certain point of law or special combinations of points.

Standard punch-card machines and the system involving vertical card fields are subject to certain weaknesses in searching indexes and records. Although codes may be designed to classify books by size, date of publication, number of pages, etc., so that as soon as a book is assigned to one class it is excluded from all other classes in the same code, a code for subjects presents a different and more complex situation, for the assignment of a book or article to one class does

<sup>1</sup>"As We May Think," by Vannevar Bush, Atlantic Monthly, Vol. 176, pp. 101-8, July, 1945.

not exclude it from other subject classes. To classify a book under two or more classes requires the use of two or more vertical card fields. This also usually requires the indexer to decide which is the major subject field and which are minor subject fields. A person searching for all books that deal with a given subject might want to examine a book even though it is indexed under a minor field. As the number of fields increases, the standard machine cannot search all of them at once or on one run of the cards for all books dealing with a certain subject, or search for books dealing with a combination of subjects. However, a new special device on the Electronic Statistical Machine in combination with a new idea of field design and card punching involving a binary code has now solved this problem. Such an arrangement is quite revolutionary for punch-card procedures, for horizontal card fields rather than vertical card fields are used in order to permit the machine to search various fields in succession on one run of the cards through the machine. This special device appears to make the recode selectors operate separately for each horizontal punching position of the card. Twelve subject fields and codes may be used and each field can accommodate a code number of ten decimal places if this large capacity is necessary.

A person desiring to locate all books dealing with the use of statistical methods to control the quality of a chemical compound used in a recently patented process to manufacture a new plastic will be able to locate all books dealing with this combination of subjects regardless of whether the book is primarily one on statistical analysis using illustration of quality control methods, or primarily a book on plastics which includes a discussion of the fact that this particular plastic would not have been possible without uniform quality of a chemical compound obtained by using statistical methods of quality control, or even a book on patent laws that happened to contain an illustration of a court case arising out of the use of this plastic and involving the presentation of evidence which included quality control charts. The machine will sort separately cards for books involving all of the subject desired, all but one subject, all but two subjects, etc.

If you have not used the binary system it might help you understand it to see it compared with the ordinary decimal system as shown below:<sup>2</sup>

Decimal System	Binary System
0	0000
1	0001

<sup>2</sup> A comparison of the binary, decimal, and octal systems may be found in *Elementary Statistical Analysis*, by Harry P. Hartkemeier, Wm. C. Brown Co., Dubuque, Iowa, 1952.

2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	00010000
11	00010001
etc.	etc.

In the number typed or printed to represent the binary code number the zeros indicate unpunched card columns and the ones indicate punched card columns. The zeros and ones have nothing to do with the zeros and ones printed on the standard punch-card design. This should become more apparent when it is realized that the holes represented by typed or printed ones might be punched in any one of the twelve horizontal card fields. So far, no one seems to have devised a simple clear way to indicate unpunched positions in the use of the binary code. This table illustrates again the fact that the binary system requires four times as much space as the decimal system, and you may be inclined to ask why anyone would use the binary system in preference to the decimal system. Actually the binary system was not developed for the particular use we have been discussing. It has been known for a long time but it came into practical use largely because of the demand for speed in the development of new calculating machines. The decimal system was translated or expressed in the form of a cog wheel or counter wheel in the early adding machines and desk calculators, but these wheels could not meet the need for greater and greater speed. The wheels gave way to relays and the relays were supplanted by vacuum tubes. The fact that the tube was either lit or not lit, on or off, must have led to the greater use of the binary system in high-speed calculators. A tube can be turned on and off much faster than a counter wheel can be revolved or a relay operated to make and break contact. I remember the first time that I told the students in a class in *Elementary Statistical Analysis* that a tube could be turned on and off at the rate of 140,000 times a second. Many students exclaimed that I must have meant an hour rather than a second—or at least a minute instead of a second. The figure 140,000 times a second actually appeared in the first manuscript copy of one of my books. Before it was set in type this figure had to be changed to 1,000,000 times a second and one of the editors wrote that surely this must be a typographical error! I wrote him that it was not a typographical error, but the figure did need to be corrected, for the rate had risen to 2,000,000

times a second. This change was made in the final proof, but it was impossible to keep up with the increase of speed, for shortly after the book was published the vacuum tube was replaced by the transistor and the rate rose to 300,000,000 oscillations a second.

The portion of the card which is set aside for horizontal fields depends upon the maximum number of digits in the code. Since binary coding requires four possible punching positions for each digit in the decimal system, if the system selected or in use contains a maximum of six decimal digits, twenty-four card columns must be used for the horizontal card fields. If a book contains a discussion of inspection and quality control the Dewey decimal system would assign the code number 658.562. In a binary system coding this number would be punched

011001011000010101100010  
6 5 8 5 6 2

If the book contains also a discussion of the techniques used in manufacturing plastics the Dewey decimal system would assign it the code number 668.41. In the usual library practice only one code number is written on the book, but up to twelve code numbers can be punched in the card for this book. Of course, in the ordinary library card file there might be two or more cards filed in different alphabetical locations with the same code or call number on the cards. For example, a card for this book might be placed under the letter "i" for inspection and quality control and, in addition, another card might be placed under the letter "p" for plastics. Since there is no digit in the third decimal place of the Dewey decimal system code number in this case, no holes would be punched in the right-hand four card columns of the number punched as

011001101000010000010000  
6 6 8 4 1 0

If the book contains enough information on statistical technique in general the librarian might wish to assign the Dewey decimal system code number 311 or a more detailed one such as 311.23, which is used to identify statistical processes of analyzing, testing, and verifying. The Dewey decimal system does not provide for a very fine classification system in the field of statistics. The third decimal place is not used in the portion of the Dewey decimal system code assigned to statistics. The number 311.23 would be punched as 001100010001001000110000.

So far we have used three binary code numbers which would involve the use of three of the twelve possible horizontal card fields on a punch-card. It would be up to the librarian, probably with the help of specialists in the various fields involved, to decide which is the major field or subject involved in the case of each book and which are minor fields. The other fields or subjects involved can be indicated by punching additional code numbers in the other nine available fields. In the case of the book just discussed the subject of manufacturing could be indicated by the Dewey decimal code number 670, the code number 547.92 could be used to indicate that the book falls in one of the special fields of organic chemistry, and the code number 608 could be used to indicate that the book discusses patents and inventions.

At first glance it may appear as if the binary system requires four times as much space as the decimal system and that this would be disadvantageous so far as the punch-card system is concerned, but the loss of horizontal space is more than offset by the gain of vertical space, for each one of the vertical punching positions can be used as a separate field. While there may be minor qualifications that could be made, in general, the use of the binary system enables us to record three times as much information as the decimal system in the same number of columns of the punch-card. To be more specific, the vertical gain of twelve times as many fields combined with the horizontal loss involved in the need for four times as much space results in a real gain of three times as much information recorded. In the illustration given above we used twenty-four card columns to arrange for twelve fields in each one of which numbers containing six digits could be recorded. If the same twenty-four card columns were used in the customary manner they would provide for only four fields in which numbers containing six digits could be recorded.

The binary system is destined to become more and more widely used and statisticians will find it increasingly necessary to become accustomed to using it in both coding work and computation. At present people are so much in the habit of using the decimal system of counting and computing that they think in terms of that system and translate the numbers into the binary system in a manner similar to the way in which many people learn a foreign language. Most high-speed computing machines perform their work, however, by using the binary system directly.

# 113th Annual Meeting of the AMERICAN STATISTICAL ASSOCIATION

Shoreham Hotel, Washington, D. C., December 27-30, 1953

## SUNDAY, DECEMBER 27

12:00 Noon. LUNCHEON BUSINESS MEETING—OUTGOING BOARD OF DIRECTORS

2:30 P.M. THE PREDICTION OF ACHIEVEMENT

**Chairman:** Harry Alpert, National Science Foundation  
**Papers:** ACHIEVING MAXIMUM PREDICTION PER UNIT OF TESTING TIME by John T. Dailey, Department of the Navy  
THE VALIDATION OF TESTING PROGRAMS FOR UNIVERSITY STUDENTS by William B. Schrader, Educational Testing Service  
STATISTICAL ASPECTS OF THE STUDY OF FAMILY INTERACTION AND THE PREDICTION OF ACHIEVEMENT MOTIVATION by Fred L. Strodtbeck, Yale University  
**Discussion:** Toby Oxtoby, Commission on Human Resources and Advanced Training

2:30 P.M. CRIMINAL, JUDICIAL AND PRISON STATISTICS

**Chairman:** Thorsten Sellin, University of Pennsylvania  
**Papers:** PROBLEMS AND PROSPECTS OF CRIMINAL STATISTICS IN THE UNITED STATES by Thorsten Sellin, University of Pennsylvania  
INTERNATIONAL CRIMINAL STATISTICS by Bengt Helger, United Nations  
**Discussion:** A. Everett Leonard, Federal Bureau of Investigation  
Edward E. Schwartz, U. S. Children's Bureau  
Henry C. Lanpher, U. S. Bureau of Prisons  
Peter Lejins, University of Maryland

2:30 P.M. STUDY AND EXPLOITATION OF RESPONSE SURFACES

*Joint with: Biometric Society (ENAR)*

**Chairman:** R. J. Hader, North Carolina State College  
**Papers:** STUDY AND EXPLOITATION OF RESPONSE SURFACES I by G. E. P. Box, Institute of Statistics, Raleigh, North Carolina  
STUDY AND EXPLOITATION OF RESPONSE SURFACES II by Stuart Hunter, Institute of Statistics, Raleigh, North Carolina  
**Discussion:** J. Youden, National Bureau of Standards  
H. E. Robbins, Raleigh, North Carolina

## MONDAY, DECEMBER 28

8:30 A.M. BREAKFAST MEETING—SECRETARIES OF ALLIED SOCIAL SCIENCE ASSOCIATIONS

8:30 A.M. BREAKFAST BUSINESS MEETING—SECTION ON TRAINING

9:00 A.M. STATISTICAL REQUIREMENTS FOR THE MEASUREMENT OF MONEY-FLOWS

**Chairman:** Daniel H. Brill, Federal Reserve Board  
**Papers:** (TITLE TO BE ANNOUNCED) by Morris A. Copeland, Cornell University  
(TITLE TO BE ANNOUNCED) by Harris Loewy, Bankers Life Company  
**Discussion:** George Garvy, Federal Reserve Bank of New York  
George T. Conklin, Guardian Life Insurance Company

9:00 A.M. APPLICATION OF STOCHASTIC METHODS TO STUDIES OF GROWTH

*Joint with: Biometric Society (ENAR) and Institute of Mathematical Statistics*

**Chairman:** (To Be Announced)  
**Papers:** STOCHASTIC PROCESSES AND THEIR APPLICATION TO GROWTH OF POPULATIONS, EPIDEMICS AND RUMORS by A. T. Reid, University of Chicago  
A STOCHASTIC MODEL FOR SELECTION OF MICRO-NUCLEI IN PARAMECIUM GROWTH by A. W. Kimball and A. S. Householder, Oak Ridge, Tennessee

9:00 A.M. INVENTORY CYCLES

*Joint with: American Economic Association*

**Chairman:** Ruth P. Mack, National Bureau of Economic Research  
**Panel:** Moses Abramovitz, Stanford University  
Gardner Ackley, University of Michigan  
Robert Armstrong, Enka American Corp.  
Victor Fuchs, Columbia University  
Albert Monnett, Jr., United States Steel  
Franco Modigliani, Carnegie Institute of Technology  
Arthur Rosenbaum, Sears, Roebuck and Co.



9:00 A.M. THE ADEQUACY OF CONSUMER CREDIT STATISTICS

**Chairman:** Reavis Cox, University of Pennsylvania  
**Papers:** RECENT REVISIONS OF CONSUMER CREDIT STATISTICS by Homer Jones, Board of Governors, Federal Reserve System  
LIMITATIONS OF CONSUMER CREDIT STATISTICS by Ernest A. Dauer, Household Finance Corporation  
THE PROFESSIONAL ADVISORY COMMITTEE AND FEDERAL STATISTICAL AGENCIES by Bruce D. Mudgett, University of Minnesota

9:00 A.M. VISITS TO GOVERNMENT AGENCIES

**Chairman:** Stuart A. Rice, Bureau of the Budget  
**Papers:** DEMONSTRATION OF THE SEAC (STANDARD EASTERN AUTOMATIC COMPUTER) by Sam Alexander, National Bureau of Standards  
DEMONSTRATION OF THE UNIVAC AND OF CENSUS TECHNIQUE by Robert W. Burgess, Bureau of the Census  
DEMONSTRATION OF BLS TECHNIQUE by Sam Weiss, Bureau of Labor Statistics  
Thomas Mosiman (alternate)  
AGRICULTURE by Frederick V. Waugh, Bureau of Agricultural Economics  
MINES by Paul McGann, Bureau of Mines

10:30 A.M. SOME RECENT FOLLOW-UP MORTALITY INVESTIGATIONS

*Joint with: American Public Health Association and American Association of University Teachers of Insurance*

**Chairman:** Arthur W. Hedrich, Maryland State Department of Health  
**Papers:** A FOLLOW-UP STUDY OF FORMER PRISONERS OF WAR by Bernard M. Cohen, National Research Council  
INSURANCE MORTALITY INVESTIGATIONS OF PHYSICAL IMPAIRMENTS by Edward A. Lew, Metropolitan Life Insurance Company  
MORTALITY AFTER RETIREMENT by Robert J. Myers, Social Security Administration  
**Discussion:** Paul M. Densen, University of Pittsburgh  
Harold F. Dorn, National Institute of Health  
Ray Peterson, Equitable Life Assurance Society

10:30 A.M. BEHAVIOR OF WAGES

*Joint with: American Economic Association and Industrial Relations Research Association*

**Chairman:** Ewan Clague, Bureau of Labor Statistics  
**Papers:** WAGES IN THE UNITED STATES SINCE 1914 by Leo Wolman, Columbia University  
TRENDS AND CYCLES IN GERMAN WAGES by Gerhard Bry, National Bureau of Economic Research  
IMPACT OF UNIONS ON INTERNAL WAGE STRUCTURE AND ADMINISTRATION by H. M. Douty, Bureau of Labor Statistics  
**Discussion:** Joseph Shister, University of Buffalo  
John T. Dunlop, Harvard University

10:30 A.M. ANALYTICAL REPORTS FROM THE 1950 CENSUS

**Chairman:** Ralph G. Hurlin, Russell Sage Foundation  
**Papers:** CHANGING GEOGRAPHIC PATTERNS OF MIGRATION IN THE UNITED STATES by Henry S. Shryock, Bureau of the Census  
VALUE OF DWELLING IN RELATION TO INCOME by Margaret G. Reid, University of Chicago  
SOME OBSERVATIONS ON THE INEQUALITY OF INCOMES by Herman P. Miller, Bureau of the Census  
**Discussion:** Dorothy S. Brady, Bureau of Labor Statistics

10:30 A.M. RECENT DEVELOPMENTS IN STATISTICAL TRAINING

**Chairman:** (To Be Announced)  
**Panel:** Paul G. Homeyer, Iowa State College  
George E. Nicholson, University of North Carolina  
A. H. Bowker, Stanford University  
John W. Lehman, Joint Committee on the Economic Report  
Samuel S. Wilks, Princeton University  
I. R. Savage, National Bureau of Standards

10:30 A.M. DEVELOPMENTS IN STATISTICAL TECHNIQUES OF THE LAST DECADE OF SPECIAL INTEREST TO ECONOMISTS

**Chairman:** W. Allen Wallis, University of Chicago  
**Papers:** THE PROBLEM OF NON-NORMALITY AND NON-PARAMETRIC TESTS by Wililam H. Kruskal, University of Chicago  
STATISTICAL THEORIES OF CHOICE AND DECISION by David H. Blackwell, Howard University

12:00 Noon. BUSINESS MEETING—BIOMETRIC SECTION

12:30 P.M. LUNCHEON MEETING—ECONOMIC FORECAST

**Chairman:** Martin Gainsbrugh, National Industrial Conference Board  
**Speakers:** Courtney C. Brown, Standard Oil of New Jersey  
Gerhard Colm, National Planning Association  
Frederick V. Waugh, Department of Agriculture

2:30 P.M. INTERLABORATORY TESTS

**Chairman:** Cuthbert Daniel, Engineering Statistician, New York  
**Papers:** EXPERIMENTAL DESIGNS IN STUDIES OF HOMOGENEITY by B. F. Scribner and R. E. Michaelis, National Bureau of Standards  
STATISTICAL PRINCIPLES OF TESTING by John Mandel, National Bureau of Standards

- 2:30 P.M. CONTRIBUTION OF STATISTICS TO POLICY ON SCIENTIFIC MANPOWER  
**Chairman:** Seymour L. Wolfbein, Bureau of Labor Statistics  
**Papers:** STATISTICAL ASPECTS OF SCIENTIFIC MANPOWER POLICY by Eli Ginzberg, Columbia University  
 RECENT ADVANCES IN MEASUREMENT OF REQUIREMENTS AND RESOURCES by Harold Goldstein, Bureau of Labor Statistics  
**Discussion:** Donald Bridgman, American Telephone and Telegraph Company  
 Harry Alpert, National Science Foundation Research and Development Board
- 2:30 P.M. STATISTICAL IMPROVEMENTS IN THE BUREAU OF MINES  
**Chairman:** Donald C. Riley, Bureau of the Budget  
**Papers:** AN EXAMINATION OF THE ASA SURVEY ON THE "STATISTICAL OPERATIONS OF THE BUREAU OF MINES" by Thomas H. Miller, Bureau of Mines  
 Sam H. Schurr, Bureau of Mines (alternate)  
 FIRST STEPS TOWARD IMPROVEMENT OF MINERAL STATISTICS by J. E. Morton, Cornell University
- 2:30 P.M. INTERCENSAL NEEDS FOR POPULATION DATA BY SMALL AREAS  
**Chairman:** Philip Hauser, University of Chicago  
**Papers:** WHAT ARE PRINCIPAL INTERCENSAL NEEDS FOR POPULATION DATA by W. R. Simons, W. R. Simons and Associates Research, Inc.  
 METHODS OF MEETING SMALL AREA DATA NEEDS by Conrad Taeuber, Bureau of the Census
- 4:00 P.M. AN INTEGRATED SYSTEM OF STATISTICAL INTELLIGENCE  
**Chairman:** Clarence D. Long, Johns Hopkins University  
**Papers:** PROPOSALS FOR A FEDERAL STATISTICAL SYSTEM by Aryness Joy Wickens, Bureau of Labor Statistics  
 PROBLEMS OF COORDINATING THE UNITED STATES STATISTICAL SYSTEM by Stuart Rice, Bureau of the Budget  
 PROBLEMS OF COORDINATING THE CANADIAN STATISTICAL SYSTEM by Herbert Marshall, Dominion Statistician, Canada  
**Discussion:** William Leonard, United Nations  
 C. F. Carter, Queens University, Ireland  
 Martin Gainsbrugh, National Industrial Conference Board
- 4:00 P.M. A CRITICAL EVALUATION OF THE NEW BLS INDEXES OF PRODUCTIVITY IN MANUFACTURING  
**Chairman:** Irving Siegel, Twentieth Century Fund  
**Papers:** THE NEW BLS INDEXES OF PRODUCTIVITY IN MANUFACTURING by Leon Greenberg and Allen Searle, Bureau of Labor Statistics  
**Discussion:** Lazare Teper, International Ladies' Garment Workers' Union  
 Martin Gainsbrugh, National Industrial Conference Board  
 William H. Nicholls, Vanderbilt University
- 4:00 P.M. SURVEYS OF AGING PERSONS BENEFITING FROM SOCIAL SECURITY PROGRAMS  
**Chairman:** Eveline M. Butts, New York School of Social Work  
**Papers:** METHODOLOGICAL PROBLEMS AND FINDINGS OF SURVEY OF AGED BENEFICIARIES OF OLD-AGE AND SURVIVORS INSURANCE by Edna C. Wentworth, Social Security Administration  
 METHODOLOGICAL PROBLEMS AND FINDINGS OF STUDY OF RECIPIENTS OF OLD-AGE ASSISTANCE by Thomas G. Hutton, Social Security Administration
- 4:00 P.M. UNSOLVED PROBLEMS IN EXPERIMENTAL STATISTICS  
*Joint with: Biometric Society (ENAR)*  
**Chairman:** Lee Crump, University of Rochester  
**Papers:** UNSOLVED PROBLEMS IN EXPERIMENTAL STATISTICS by J. W. Tukey, Princeton University  
**Discussion:** R. L. Anderson, Raleigh, North Carolina  
 H. Scheffe, University of California, Berkeley
- 5:00 P.M. ANNUAL BUSINESS MEETING—FOR ALL MEMBERS
- 7:30 P.M. PRESIDENTIAL ADDRESS—William G. Cochran, Johns Hopkins University
- 9:00 P.M. INFORMAL PARTY AND RECEPTION

## TUESDAY, DECEMBER 29

- 8:30 A.M. CHAPTER SECRETARIES BREAKFAST MEETING
- 9:00 A.M. BUSINESS MEETING—BUSINESS AND ECONOMIC STATISTICS SECTION
- 9:00 A.M. CONTRIBUTED PAPERS SESSION  
*Joint with: Biometric Society (ENAR)*  
**Chairman:** W. T. Federer, Cornell University  
**Papers:** (TITLES TO BE ANNOUNCED)

- 9:00 A.M. CRITIQUE OF FEDERAL STATISTICS: CONSTRUCTION STATISTICS  
**Chairman:** Peyton Stapp, Bureau of the Budget  
**Papers:** SHORTCOMINGS OF THE CONSTRUCTION ESTIMATES FOR PRODUCTION PLANNING OF MATERIALS by Miles Colean, Business Consultant, Washington, D. C.  
INADEQUACIES OF THE CONSTRUCTION ESTIMATES AS GENERAL ECONOMIC MEASURES by Walter Hoadley, Jr., Armstrong Cork Company  
**Discussion:** Frank Garfield, Federal Reserve Board  
Leo Grebler, Columbia University  
George O. Trenchard, Firestone Tire and Rubber Company
- 9:00 A.M. APPLICATION OF SURVIVORSHIP METHODS  
*Joint with: Biometric Society (ENAR), Institute of Mathematical Statistics, American Public Health Association*  
**Chairman:** A. Birnbaum, National Foundation for Infantile Paralysis  
**Papers:** ESTIMATION OF LENGTH OF STAY FROM DISCHARGE DATA by C. A. Bachrach  
PARAMETRIC ESTIMATION OF FAILURE RATES by D. J. Davis  
**Discussion:** T. N. E. Greville  
B. Epstein
- 9:00 A.M. STATISTICS IN GEOLOGY  
**Chairman:** William G. Schlecht, U. S. Geological Survey  
**Papers:** ANALYSIS OF VARIANCE MODELS IN SEDIMENTARY PETROLOGY by John C. Griffiths, Pennsylvania State College  
PROBLEMS IN SAMPLING A GEOLOGICAL FORMATION by Robert A. Gulbrandson, U. S. Geological Survey  
**Discussion:** Felix Chayes, Geophysical Laboratory, Carnegie Institute of Washington
- 10:30 A.M. CAPITAL AND MATERIALS PRODUCTIVITY  
**Chairman:** Raymond T. Bowman, University of Pennsylvania  
**Papers:** CAPITAL COEFFICIENTS IN CERTAIN METAL FABRICATING INDUSTRIES by Almarin Phillips, University of Pennsylvania  
CAPITAL COEFFICIENTS IN CERTAIN MINERALS PRODUCING OR MINERALS REFINING INDUSTRIES by Frederick T. Moore, Bureau of Mines
- 10:30 A.M. ADEQUACY OF INTERNATIONAL TRADE STATISTICS FOR ECONOMIC AND BUSINESS ANALYSIS  
**Chairman:** William R. Leonard, United Nations  
**Papers:** FACTORS AFFECTING ADEQUACY OF DATA ON FOREIGN TRADE by Oskar Morgenstern, Princeton University  
CORRECTIVE ACTION AND APPRAISALS OF ACCURACY by J. Edward Ely, Bureau of the Budget  
**Discussion:** Redington Fiske, Editor, *Export Trade and Shipper*  
Harry S. Radcliffe, National Council of American Importers  
J. C. Stark, McGraw-Hill International Corporation
- 10:30 A.M. CENSUS PROBLEMS AND PROCEDURES  
**Chairman:** Robert W. Burgess, Bureau of the Census  
**Papers:** THE CURRENT STATISTICS PROGRAM OF THE CENSUS BUREAU by A. Ross Eckler and Conrad Taeuber, Bureau of the Census  
DEVELOPMENTS IN COLLECTION AND PROCESSING OF MASS STATISTICAL DATA by Morris H. Hansen and William N. Hurwitz, Bureau of the Census  
"SPOTCHECKS" IN LIEU OF COMPLETE CENSUSES by Howard C. Grieves, Bureau of the Census
- 10:30 A.M. METHODOLOGICAL PROBLEMS OF MORBIDITY SURVEYS—I  
**Chairman:** Paul M. Densen, University of Pittsburgh  
**Papers:** QUESTIONNAIRE DESIGN AND RELATED METHODOLOGICAL PROBLEMS INVOLVED IN THE CANADIAN MORBIDITY SURVEY by R. Kohn, Dominion Bureau of Statistics, Canada  
RESPONDENT ERROR AS MEASURED IN SOME PITTSBURGH MORBIDITY SURVEY MATERIAL by Daniel G. Horvitz, University of Pittsburgh
- 12:00 NOON LUNCHEON MEETING—INCOMING BOARD AND COUNCIL
- 12:30 P.M. LUNCHEON MEETING—STOCK MARKET FORECAST FOR 1954  
**Chairman:** Samuel Jones, Fire Association of Philadelphia  
**Papers:** THE OUTLOOK FOR RAILROAD AND RAIL EQUIPMENT SHARES by Pierre R. Bretey  
TRENDS IN MONETARY STRUCTURE IN 1954 by W. Dutton Morehouse, National Federation of Financial Analysts Societies  
THE CHANGING STOCK MARKET by Sidney B. Lurie, New York Society of Security Analysts
- 2:30 P.M. THE TEACHING OF STATISTICS IN A GRADUATE SCHOOL OF BUSINESS ADMINISTRATION  
**Chairman:** G. Rowland Collins, New York University  
**Papers:** ON THE TEACHING OF STATISTICS IN A GRADUATE SCHOOL OF BUSINESS ADMINISTRATION by W. Edwards Deming, New York University  
**Discussion:** TEACHING STATISTICS TO BUSINESS EXECUTIVES by Allen Wallis, University of Chicago  
Max A. Woodbury, University of Pennsylvania  
Lester Frankel, Alfred Politz Research, Inc.

2:30 P.M. METHODOLOGICAL PROBLEMS OF MORBIDITY SURVEYS—II

**Chairman:** (To Be Announced)

**Papers:** THE HOSPITAL MORBIDITY REPORTING PROJECT IN NEW YORK CITY by Carl Erhardt, New York City Department of Health and Marta Fraenkel  
VALIDATION OF SURVEY DATA BY COMPARISON WITH MEDICAL RECORDS by Nedra Belloc, California State Department of Health

2:30 P.M. BUSINESS INVESTMENT PLANS AND THEIR REALIZATION

*Joint with: Econometric Society*

**Chairman:** Franco Modigliani, Carnegie Institute of Technology

**Papers:** EXPECTATIONS, PLANS AND CAPITAL EXPENDITURES—A SYNTHESIS OF EX-ANTE AND EX-POST DATA by Robert Eisner, Northwestern University  
EFFECT OF CURRENT OPERATING EXPERIENCE ON THE REALIZATION OF INVESTMENT PLANS by Jean Bronfenbrenner

**Discussion:** Irwin Friend, University of Pennsylvania

2:30 P.M. CONCENTRATION IN INDUSTRY

*Joint with: American Economic Association*

**Chairman:** Rufus S. Tucker, General Motors Corporation

**Papers:** (TITLE TO BE ANNOUNCED) by A. D. H. Kaplan, Brookings Institution  
(TITLE TO BE ANNOUNCED) by G. Warren Nutter, Yale University

**Discussion:** Clare E. Griffin, University of Michigan  
John M. Blair, Federal Trade Commission

4:00 P.M. STATISTICS IN PHYSICS

**Chairman:** E. W. Pike, Raytheon Manufacturing Company

**Papers:** PROBABILITY PROBLEMS IN PHYSICS by Glenn W. Preston, Philco Corporation  
STATISTICAL PROBLEMS IN PHYSICS by Martin L. Berger, National Bureau of Standards  
THE STATISTICIAN IN THE DEVELOPMENT LABORATORY by Besse B. Day, Naval Engineering Experiment Station

**Discussion:** David Wallace, Massachusetts Institute of Technology

4:00 P.M. SOME PROBLEMS IN STATISTICAL PHILOSOPHY

**Chairman:** (To Be Announced)

**Papers:** SOME PROBLEMS IN STATISTICAL PHILOSOPHY by F. J. Anscombe

4:00 P.M. BUSINESS MEETING—REPORT FROM THE COMMITTEE ON STATISTICS IN THE PHYSICAL SCIENCES

8:00 P.M. STATISTICAL APPLICATIONS TO ACCOUNTING AND AUDITING PROBLEMS

**Chairman:** John W. McEachren, Touche, Niven, Bailey & Smart

**Papers:** STATISTICAL TECHNIQUES APPLIED TO THE AGING OF ACCOUNTS RECEIVABLE by R. M. Cyert, Carnegie Institute of Technology

**Discussion:** W. Edwards Deming, New York University

8:00 P.M. EXPERIMENTAL METHODS USED IN THE TEACHING OF STATISTICS

**Chairman:** J. A. Rigney, North Carolina State College

**Papers:** USE OF EXPERIMENTS IN ENGINEERING STATISTICS by I. W. Burr, Purdue University  
INSTRUCTION FOR QUALITY CONTROL BY DEMONSTRATION DEVICES by R. E. Wagenhals, Timken Roller Bearing Company  
SOME NOTES ON USING THE EXPERIMENTAL APPROACH by E. G. Olds, Carnegie Institute of Technology

**Discussion:** F. Massey, University of Oregon

## WEDNESDAY, DECEMBER 30

9:00 A.M. STATISTICS IN ENGINEERING

**Chairman:** W. Allen Wallis, University of Chicago

**Papers:** USE OF STATISTICS IN ENGINEERING by Andre G. Laurent, University of Chicago  
STATISTICAL DETERMINATION OF TOLERANCES IN ROCKET DEVELOPMENT by Edwin Crow, Naval Ordnance Test Station  
AN EXAMPLE OF FRACTIONAL REPLICATION IN A BEARING ABRASIVE WEAR TEST by Francis Del Priore and William J. Kommers, Naval Engineering Experiment Station  
THE UP AND DOWN METHOD FOR SMALL SAMPLES by J. L. Hodges, University of California

**Discussion:** K. A. Brownlee, University of Chicago  
William R. Pabst, Navy Department  
Harry G. Romig, Hughes Aircraft



- 9:00 A.M. LONGITUDINAL STUDY OF HEALTH INSURANCE PLAN OF GREATER NEW YORK  
**Chairman:** Forrest E. Linder, United Nations  
**Papers:** BACKGROUND AND FINDINGS OF PILOT STUDY by Neva R. Deardorff, Health Insurance Plan of New York  
 METHODS EMPLOYED AND METHODOLOGICAL PROBLEMS ENCOUNTERED by Nathan Goldfarb, Health Insurance Plan of New York
- 9:00 A.M. CONTRIBUTED PAPERS SESSION  
**Chairman:** Max Woodbury, University of Pennsylvania  
**Papers:** (TITLES TO BE ANNOUNCED)
- 9:00 A.M. BUSINESS MEETING—COMMITTEE ON STATISTICS IN THE SOCIAL SCIENCES
- 10:30 A.M. THE INDUSTRY VERSUS THE COMMODITY APPROACH IN THE MEASUREMENT OF WHOLESALE PRICES  
**Chairman:** Peyton Stapp, Bureau of the Budget  
**Papers:** THE CASE FOR THE INDUSTRY APPROACH by Barrie Davis, United Nations  
 THE COMMODITY APPROACH by Edgar Eaton, Bureau of Labor Statistics  
**Discussion:** Lotne E. Rowebottom, Dominion Bureau of Statistics, Canada  
 Clayton Gehman, Federal Reserve Board
- 10:30 A.M. DEMAND ANALYSIS BASED UPON CONSUMER-PANEL DATA  
*Joint with: American Farm Economic Association*  
**Chairman:** Frederick V. Waugh, Bureau of Agricultural Economics  
**Papers:** THE DEMAND FOR CITRUS FRUITS by George M. Kuznets, University of California and Richard J. Foote, Bureau of Agricultural Economics  
 THE DEMAND FOR MEATS by Ayers Brinser, Harvard University  
 DEMAND ANALYSIS FROM THE M. S. C. CONSUMER PANEL by G. G. Quackenbush, Michigan State College  
**Discussion:** Margaret Reid, University of Chicago  
 Marguerite C. Burk, Bureau of Agricultural Economics
- 10:30 A.M. ROLE OF A CENTRALIZED STATISTICAL ORGANIZATION IN A UNIVERSITY  
**Chairman:** Carl F. Kossack, Purdue University  
**Panel:** T. A. Bancroft, Iowa State College  
 Albert H. Bowker, Stanford University  
 Gertrude Cox, University of North Carolina  
 George Darroch, Washington State College  
 H. C. Fryer, Kansas State College  
 Herbert A. Meyer, University of Florida  
 Jerzy Neyman, University of California  
 Herbert Solomon, Columbia University  
 W. Allen Wallis, University of Chicago
- 10:30 A.M. PRELIMINARY TESTS AND POOL RULES  
*Joint with: Biometric Society (ENAR) and Institute of Mathematical Statistics*  
**Chairman:** W. G. Cochran, Johns Hopkins University  
**Papers:** (TITLE TO BE ANNOUNCED) by A. E. Paull, Abitibi Power and Paper Company, Ltd.  
 SOME APPLICATIONS by T. A. Bancroft, Iowa State College  
**Discussion:** Robert Bechhofer, Cornell University  
 G. W. Snedecor, Iowa State College
- 12:30 P.M. 1953 CENSUS TRACT CONFERENCE  
**Chairman:** Howard Whipple Green, Cleveland Health Council  
**Papers:** THE RELATION OF CENSUS TRACTS TO THE GENERAL CENSUS PROGRAM by Robert W. Burgess, Bureau of the Census  
 USE OF CENSUS TRACTS BY CANADIAN CITIES by O. A. Lemieux, Dominion Bureau of Statistics, Canada  
 EXTENSION OF USE OF CENSUS TRACTS FOR BUSINESS ANALYSIS by Petty H. Méyers, Allied Stores Corporation  
 USE OF CENSUS TRACTS IN CONNECTION WITH STUDY OF CHANGING RESIDENTIAL PATTERNS IN METROPOLITAN AREAS by George Duggar, University of California  
 HOW THE AUTOMOBILE INDUSTRY USES CENSUS TRACTS by Ferdinand F. Mauser, Wayne University  
 USE OF CENSUS TRACTS IN NEW YORK CITY by Florence E. Cuttrell, Welfare and Health Council of New York City  
 USE OF CENSUS TRACTS BY HOUSING PEOPLE by Dorothy S. Montgomery, Philadelphia Housing Association  
 USE OF CENSUS TRACTS IN CONNECTION WITH CLASSIFIED ADVERTISING APPEARING IN A METROPOLITAN NEWSPAPER by Roy Wenzlick, Roy Wenzlick & Company
- 2:30 P.M. EXPERIMENTAL PROCEDURES IN THE PHYSICAL SCIENCES  
**Chairman:** Churchill Eisenhart, National Bureau of Standards  
**Papers:** NEW EXPERIMENTAL DESIGNS by W. S. Connor, National Bureau of Standards  
 SOME ASPECTS OF SEQUENTIAL EXPERIMENTATION by Sutton Monroe, Bell Telephone Laboratories  
 INFORMATION THEORY AND PREDICTION by Max Woodbury, University of Pennsylvania  
**Discussion:** Edgar P. King, Eli Lilly and Company  
 Marvin Zelen, National Bureau of Standards  
 Glenn W. Brier, U. S. Weather Bureau

# REPORT OF ASA ADVISORY COMMITTEE ON STATISTICAL POLICY TO THE BUREAU OF THE BUDGET

## STATEMENT OF PRINCIPLES WITH RESPECT TO DIRECT GOVERNMENT COLLECTION OF STATISTICAL DATA

The Office of Statistical Standards, Bureau of the Budget, asked the Committee for advice on what factors to consider in deciding when statistics should be collected directly by the Government, with its own personnel and facilities, and when they should be collected for the Government by outside agencies under contract. To assure agreement on the terms of reference, the question was defined as referring to surveys (1) previously agreed upon, (2) financed by the Federal Government, and (3) concerned primarily with the collection and tabulation of mass statistical data and their presentation in statistical tables. Research projects where collected data are incidental to the general objective of the project were not included in the Committee's consideration.

Bearing upon the problem of direct versus contract collection of data, are some general distinctions among the purposes that should be served by Federal statistics. All statistical series collected at Government expense should serve a public interest rather than a narrow private purpose. We would define a public interest as pertaining to those subjects on which the Government requires information for policy formulation and for effective administration. Likewise we would consider information to be in the public interest if it is of value to broad segments of our political and economic life. It is possible to distinguish a number of such purposes or origins.

1. Many governmental statistics arise as by-products of administrative requirements—for example, those compiled from tax returns or from the financial reports filed with the Securities and Exchange Commission. Data of this kind obviously must be collected by the Government alone.

2. Some statistics are collected for direct use by the Government—for example, the Decennial Census of Population, which provides the basis for apportioning Congressional representation among the states, and the Agricultural Parity Indexes, which provide the basis for the price support program.

3. Many statistics are collected for indirect use by the Government, as an aid in policy formulation or guidance—for example, the Survey of Consumer Finances (Federal Reserve Board); farm income statistics (Agriculture); and labor force and unemployment estimates (Census).

4. Many statistics are collected for general public purposes—for example, the Censuses of industry and trade (Census); the Consumers' Price Index (BLS); data on mineral production (Mines); mortality data (Public Health).

Obviously these classes are not mutually exclusive, and most of the Government's statistical series fit into more than one class. Data from the BLS, for instance, may be used directly by the Congress in legislating on minimum wages. They may also be used indirectly as an aid in policy formulation, and to meet general public needs.

The Committee agreed, as a basic principle, that the issuing agency and the Government should accept full responsibility for the quality of any statistical data issued by it. Different series may have different degrees of usefulness and reliability and the users should be told about these, with the issuing agency responsible for the maintenance of the stated degree of accuracy. This principle does not imply that all such statistics should be completely free of errors. It is recognized that the degree of accuracy of all statistics is affected by the resources devoted to them and the uses to be made of them. The principle does mean, however, that the issuing agency should make every effort to determine the limitations of the data, and should publish a description of the data in as definite and specific terms as possible. The description should emphasize their limitations and warn against potential uses for which the data are not suitable. (The "Standards for the Publication of Statistical Data" issued by the Bureau of the Budget set forth the responsibilities of the issuing agency for an adequate description of uses and limitations of the data.)

The Committee also agreed, as a corollary, that the collection of data is not yet highly standardized. It is impossible, at present, to determine without elaborate supervision and inspection procedures whether any given survey satisfactorily adheres to given specifications. It follows that the full weight of Government authentication cannot feasibly be given to surveys conducted by outside agencies.

From this principle, and its corollary, the Committee concluded that, as a general rule, large-scale statistical surveys financed by the Government should be conducted directly by the Government, and that the burden of proof must fall on proposals to conduct such surveys by contract with nongovernmental agencies.

(This principle does not bear on the question of when the Government should assume responsibility for making surveys or supplying statistical data. It relates only to the more limited question of whether data collections that are to be made at Government expense should be undertaken directly by Government agencies or by contract with outside organizations.)

The Committee considered at length the question of the relative costs of data collection by the government and by outside organizations under contract to the government. It concluded that optimal utilization of the large statistical units which already exist within the government would generally be the most economical method of conducting surveys. The collection of public purpose statistics is an established function of government. There are presently within the government strong statistical facilities, with an excellent record in the development and

CONTINUED ON PAGE 33

## NEWS ABOUT MEMBERS

**A** **Asher Achinstein** is on loan to the Council of Economic Advisers from the Legislative Reference Service of the Library of Congress.

**Virgil Anderson**, Assistant Professor in the Statistical Laboratory and Statistics Section of the Department of Mathematics at Purdue, received the degree of Ph.D. with statistics major at Iowa State College in June 1953. His thesis is entitled "A Model for the Study of Quantitative Inheritance."

**Arthur G. Auble**, formerly Associate Professor of Business Statistics at the School of Commerce, Northwestern University, has been appointed Associate Professor of Business Statistics at Claremont Men's College, Claremont, California.

**B** **Louis H. Bean** retired from government service on June 30. Mr. Bean, who served as an economist in the Office of the Secretary of Agriculture until early this year and recently in the Bureau of Agricultural Economics, is remaining in Washington as an independent economic consultant.

**Robert Bechhofer**, formerly Assistant Professor of Industrial Engineering and Director of the Statistical Consulting Service of the Department of Mathematical Statistics, Columbia University, has been appointed Associate Professor in the Department of Industrial and Administrative Engineering, Sibley School of Mechanical Engineering, Cornell University.

**Donald R. Belcher** has been appointed an Assistant Director of the Bureau of the Budget. Mr. Belcher was formerly associated with the American Telephone and Telegraph Company, of which he was Treasurer from 1944 until his retirement in 1952. He is a Fellow of the American Statistical Association.

**Kurt Benjamin** is now Methods Analyst and Tabulating Manager at the Pullman Couch Company, Chicago.

**D. J. Bogue** has been promoted from Demographer to Associate Director of the Scripps Foundation for Research in Population Problems, Miami University, Oxford, Ohio.

**Alvin A. Burger**, who has recently become Executive Director of the Texas Research League at Austin, Texas, was incorrectly listed in the June-July issue as Alice A. Burger. We regret the error.

**Ralph E. Burgess**, formerly of Commodity Marketing Corporation, the industrial consulting business he founded and headed for six years, has been appointed Economist for the American Cyanamid Company in New York City.

**C** **A. E. Cascino** has been appointed director of market research for the consolidated Crosley and Bendix Home Appliances Divisions of AVCO Manufacturing Corporation. He was formerly director of market research for Bendix Home Appliances.

**F. Stuart Chapin**, who has been at the University of Minnesota since 1922 as Professor of Sociology, Chairman of the Department of Sociology, and Director of the School of Social Work, retired from active duty in June 1953, and has taken permanent residence at Asheville, North Carolina, as a research consultant. Professor Chapin is a Fellow of the American Statistical Association.

**Thomas F. Corcoran** has returned to the Census Bureau from an eighteen-month assignment in Karachi, where he served on a Technical Cooperation Administration mission as statistical consultant to the Government of Pakistan. He has resumed his former position as Chief of Consultation and Training in the Office of the Coordinator, International Statistics.

**D** **Masil B. Danford** has completed his graduate program at the Institute of Statistics, North Carolina State College, at Raleigh, North Carolina, and is now working as an analytical statistician at the U. S. Air Force's School of Aviation Medicine, Randolph Field, Texas.

**William R. Davison**, formerly Acting Director of the Research Service, Stephens College, has accepted a position as Analytical Statistician at the Ordnance Ammunition Center, Joliet, Illinois.

**J. Frederic Dewhurst** became Executive Director of the Twentieth Century Fund on August 9, succeeding Evans Clark, the Fund's first Executive Director, who retired after twenty-five years in that post. Dr. Dewhurst has been Economist of the Twentieth Century Fund since 1933. Previously he was Professor of Industry at the Wharton School of Finance and Commerce, University of Pennsylvania, and Economist of the American Iron and Steel Institute. His government service includes two years as Chief of the Division of Economic Research of the U. S. Department of Commerce and he served as a representative of the United States at the international statistical conferences in Geneva in 1928 and 1932. He is a Fellow of the American Statistical Association.

**Joseph S. Dinsmore** is teaching statistics and mathematics in the Department of Mathematics at the University of Maine in Orono.

**F** **C. D. Ferris**, formerly Staff Quality Control Engineer of Bigelow-Sanford Carpet Company, has been appointed Quality Control Manager, Mohawk Carpet Mills, Inc.

**Merrill M. Flood** has accepted a position as Professor of Industrial Engineering at Columbia University.

**G** **David G. Gosslee** who has been on leave of absence to study for a Ph.D. in statistics at North Carolina State College, is returning to his position in the Mathematics Department at North Dakota Agricultural College, Fargo, North Dakota.

**James C. Groble**, formerly with the Department of Labor, is now employed by the Illinois Bell Telephone Company.

**William Grodowitz** has transferred from Chief of the Planning and Analysis Branch, Biometrics Division, Office of the Air Surgeon, Washington, D. C., to Operations Analyst with the Operations Analysis Division at the Air Proving Ground, Eglin Air Force Base, Florida.

**Creighton N. Guellow** has transferred from the Production and Marketing Administration to become a statistician in the Division of Fruit and Vegetable Statistics in the Bureau of Agricultural Economics.

**E. Cuyler Hammond** has been appointed Professor of Biometry in the Graduate School at Yale University. He will continue in his present position as Director of the Statistical Research Section of the American Cancer Society.

**H. O. Hartley** has joined the staff of the Statistical Laboratory and Department of Statistics of Iowa State College as visiting research professor for one year—on leave of absence from University College, London. He will conduct seminar courses, at the advanced graduate level, on the theory of statistics, theory of sample surveys, and advanced statistical methods. In addition he will continue research work and be available to staff for consulting on sample survey design.

**Junia H. Honnold**, Chief of the Financial Statistics Section, Population and Housing Division, Bureau of the Census, has transferred to the Central Intelligence Agency.

**Daniel Horn**, of the Statistical Research Section of the American Cancer Society, has been appointed as Lecturer at Yale University. He will also continue his work with the American Cancer Society.

**Theodore W. Horner**, Assistant Statistician in the Institute of Statistics, North Carolina State College, has taken a position as Assistant Professor in the Statistical Laboratory and Department of Statistics, Iowa College.

**Morris Horowitz**, formerly Director of Case Analysis of the Wage Stabilization Board, has accepted a position as research associate at Harvard University.

**Daniel G. Horvitz**, has resigned as Assistant Professor in the Department of Biostatistics, Graduate School of Public Health, University of Pittsburgh, to accept a position as Associate Professor in the Department of Experimental Statistics, North Carolina State College.

**Walter W. Hoy** is now employed by Chance Vought Aircraft as a Senior Project Engineer doing work in statistics.

**Howard B. Huffman** has moved to Columbus to study for a Ph.D. degree in Business Organization at Ohio State University.

**David Huntsberger** was promoted from Instructor to Assistant Professor in Statistics at Iowa State College, Ames, Iowa.

**Stanley L. Isaacson**, Assistant Professor of Statistics at Iowa State College, has accepted an appointment for one year as visiting Assistant Professor of Statistics at Stanford University. He is on leave of absence from Iowa State.

**Sidney Kaplan** has left the Planning Research Branch, Office of the Comptroller of the Army (Pentagon), to join the Computing Systems staff, RCA Victor Division, at Camden, New Jersey, where he will be doing research in computing systems, programming and coding.

**Huan Pao Kuang**, formerly with the University of Minnesota, has returned to work as a statistician in the Bureau of Economic Research and Statistics, American Dental Association, Chicago.

**Ai-Shen M. Lee**, who was formerly employed by the East Asiatic Company in San Francisco, will teach in the Business Administration Department of Pennsylvania Military College.

**Jerome Mark** of the Division of Productivity and Technological Development of the Bureau of Labor Statistics has been detailed to the Office of the Special Representative, Mutual Security Agency, Paris, to assist in implementing the productivity and technical assistance program.

**David D. Mason**, head of the Biometrical Services Unit, Bureau of Plant Industry, Soils and Agricultural Engineering of the Agricultural Research Administration, is leaving government service to join the faculty of the Institute of Statistics, University of North Carolina, as Professor of Experimental Statistics.

**Thomas J. Mills**, formerly Assistant Chief of the Office of Statistical Standards, has transferred to the National Science Foundation, where he will work in the area of scientific manpower.

**Walter Mitchell, Jr.**, formerly managing director of the Controllers Institute of America, has been elected a vice president of the Econometric Institute, Inc., New York. He will direct the Institute's Retail Trade and Food Industry Forecast services and will also be part of the organization's consulting staff.

**Edwin W. Moore**, 1st Lieutenant, USAF, has been assigned to North Carolina State College to study for the Master of Science degree in Experimental Statistics through the educational program of the U. S. Air Force Institute of Technology.

**K. R. Nair**, a Fellow of the American Statistical Association, has been elected President of the Calcutta Statistical Association for 1953. He has also been elected President, Section of Statistics, for the 41st Session of the Indian Science Congress Association to be held in Hyderabad, Deccan, in the first week of January 1954.



**Robinson Newcomb** is serving as a consultant to the Council of Economic Advisors.

**Noriar Pahigian**, formerly in the Field Division of the Bureau of the Census, has transferred to the Statistics Division, Bureau of Supplies and Accounts, Navy Department.

**Victor E. Paulos** is now employed as a mathematical statistician with the Rocket Fuels Division of the Phillips Petroleum Company, McGregor, Texas.

**Katherine Pease (Beardsley)** taught in the Psychology Department of the American University during the summer session and will be teaching during the fall and winter in the U. S. Department of Agriculture Graduate School.

**Jack N. Peterman** has transferred from the Human Factors Operations Research Laboratory, Washington, D. C., to the Technical Training Research Laboratory, Chanute Air Force Base, Illinois, as Chief of the Operational Utilization Branch of the Audio-Visual Research Division.

**Donald B. Pittman**, formerly in the Division of Field Crop Statistics, Agricultural Estimates, Bureau of Agricultural Economics, has transferred to the State Statistician's office in Denver, Colorado.

**Lowell J. Reed**, formerly Vice President of the Johns Hopkins University and Hospital, has been appointed President of the University. Dr. Reed is a Fellow and past president of the American Statistical Association.

**H. E. Riley** has completed his year's assignment to the Office of the Secretary, U. S. Department of Labor, and has resumed his duties as Chief of the Division of Construction Statistics, Bureau of Labor Statistics.

**R. J. Saulnier** of the National Bureau of Economic Research is serving as consultant to the Council of Economic Advisors.

**David Schenker**, of the Division of Productivity and Technological Developments of the Bureau of Labor Statistics, has been detailed to the Office of the Special Representative, Mutual Security Agency, Paris, to assist in implementing the productivity and technical assistance program.

**George W. Snedecor** has returned to the Statistical Laboratory, Iowa State College, after serving as consultant in experimental statistics for six months under a grant from the General Education Board—mainly at Alabama Polytechnic Institute and the University of Florida. His appointment as consultant was part of a cooperative program of statistics among the Southeastern states supported by the Institute of Statistics of the Consolidated University of North Carolina.

**Boris Stern** has returned to the Bureau of Labor Statistics after completion of an assignment with the United Nations in Israel. He is now engaged in the preparation of the Department of Labor's third yearbook (for 1953) on the subject of international labor.

**Herbert R. Tacker** is now employed by the American Brass Company as Staff Statistician.

**T. E. Taylor, Jr.**, is now in business as a public accountant in Fresno, California.

**Warren S. Thompson** has retired as Director of the Scripps Foundation for Research in Population Problems, Miami University, Oxford, Ohio—a position which he has held since 1922. During the next several months he will be engaged in a study of the growth and changes in California's population which is being sponsored by the Haynes Foundation of Los Angeles.

**Donovan J. Thompson**, Assistant Professor of Statistics at Iowa State College, was an Assistant Professor in the Department of Biostatistics at the University of Pittsburgh during the summer.

**Arthur L. Treco** is now with the Statistical Analysis Section of the Polychemicals Department, E. I. DuPont de Nemours, Inc., Wilmington, Delaware.

**Morris B. Ullman**, Chief of the Statistical Reports Section of the Bureau of the Census, has left on a year's leave of absence to serve on an economic advisory staff in Jerusalem. The staff will operate under private contract of the State of Israel with Oscar Gass Associates.

**J. Frederick Verigan** has been appointed Manager of Quality Control for the Atlas Powder Company, Wilmington, Delaware.

**J. H. Vinyard** received the degree of Master of Public Health at the University of California and has now returned to his former position as Statistician, Bureau of Statistics, Illinois Department of Public Health.

**Alfred N. Watson**, formerly with Arthur D. Little, Inc., of Cambridge, Massachusetts, has been appointed Executive Vice President of Wesleyan University Press, Inc., Columbus, Ohio, and Director of the Department of School Services and Publications, Wesleyan University, Middletown, Connecticut.

**P. K. Whelpton** has resigned as Director of the Population Division of United Nations to return to the Scripps Foundation for Research in Population Problems, from which he had had a leave of absence. He is now Director of the Foundation.

**John S. White** has accepted a position as Assistant Professor in the Department of Actuarial Mathematics and Statistics at the University of Manitoba, Winnipeg, Canada.

## CHAPTER PRESIDENTS AND SECRETARIES

- ALBANY**—Murray Dorkin, 40 Glenwood Street, Albany, New York; Abbott Weinstein, 104 Morton Avenue, Albany, New York.
- AUSTIN**—Jack G. Taylor, Investment Office, University of Texas, Austin, Texas; John R. Stockton, 113 Wag-ganer Hall, University of Texas, Austin, Texas
- BOSTON**—Sybil P. Bindloss, Liberty Mutual Insurance Co., Res. Dept., 175 Berkeley Street, Boston, Massachusetts; Mary E. Wilcox, Massachusetts Division of Employment Security, 881 Commonwealth Avenue, Boston, Massachusetts
- CENTRAL INDIANA**—William H. Andrews, 214 East 5th Street, Bloomington, Indiana; Donald L. Cheak, 5432 East 19th Street, Indianapolis, Indiana
- CENTRAL NEW JERSEY**—William J. Baumol, Associate Professor of Economics, Princeton University, Princeton, New Jersey; William B. Schrader, Educational Testing Service, Princeton, New Jersey
- CHICAGO**—Dever Sholes, 1 North La-Salle Street, Chicago 2, Illinois; John H. Oberndorf, Statistical Tabulating Company, 53 West Jackson Boulevard, Chicago 4, Illinois
- CLEVELAND**—Gale R. Ober, Jr., Howard Whipple Green & Assoc., 1001 Huron Road, Cleveland 15, Ohio; Myron F. Vincent, Ohio Bell Telephone Co., 750 Huron Road, Cleveland, Ohio
- COLUMBUS**—John R. Ervin, Ohio State Univ., Columbus, Ohio; Mikhail V. Condoide, 188 West 10th Avenue, Columbus 1, Ohio
- CONNECTICUT**—David Pinsky, Director of Labor Statistics, State Dept. of Labor, Hartford, Connecticut; Roger Stark, University of Connecticut, Storrs, Connecticut
- CUBA**—Ing. Hugo Vivo, Calle 28 No. 270, Apt. B, entre 21 y 23, Vedado, Habana, Republica de Cuba
- DAYTON**—Paul R. Rider, 422 Harmon Boulevard, Dayton 9, Ohio; Hugh B. Lewis, 16 Sweetman Street, Dayton 7, Ohio
- DENVER**—Paul R. Metty, 2910 South Marion, Englewood, Colorado; Henry C. Mosher, Economic Statistician, The Mountain States Tel. & Tel. Co., P. O. Box 960, Denver 1, Colorado
- DETROIT**—Carter M. Bowen, Purchasing Research Department, 3000 Schaefer Road, Dearborn, Michigan; Oscar Stewart, 3450 West Chicago Boulevard, Detroit 6, Michigan
- HONOLULU**—Richard S. Takasaki, 3247 Melemele Place, Honolulu 13, Hawaii; Frederick S. W. Loo, 39 Iliahi Street, Honolulu 17, Hawaii
- UNIV. OF ILLINOIS**—Horace W. Norton, University of Illinois, Urbana, Illinois; Lester Sartorius, 316 David Kinley Hall, University of Illinois, Urbana, Illinois
- ITHACA**—C. R. Henderson, Department of Husbandry, Cornell University, Ithaca, New York; Philip J. McCarthy, New York School of Industrial & Labor Relations, Cornell Univ., Ithaca, New York
- LOS ANGELES**—John C. McKee, Douglas Aircraft Company, 1301 Pearl Street, Santa Monica, California; Donald A. Smith, 1953 Redesdale, Los Angeles 14, California
- WISCONSIN**—Philip G. Fox, 403 Sterling Hall, University of Wisconsin, Madison, Wisconsin
- LOUISIANA**—Sully C. Pecot, Statistical Dept., New Orleans Public Service, Inc., New Orleans, Louisiana; Richard W. Graves, Tulane University, New Orleans, Louisiana
- NEW YORK**—Meredith B. Givens, New York State Dept. of Labor, 1440 Broadway, New York 18, New York; Henry S. Miller, Queens College, Flushing 67, Long Island, New York
- NORTH CAROLINA**—C. Horace Hamilton, Box 5428, State College Station, Raleigh, North Carolina; J. C. Sentz, Dept. of Experimental Statistics, North Carolina State College, Raleigh, North Carolina
- OKLAHOMA**—W. G. Hill, 2704 N. W. 44th Street, Oklahoma City, Oklahoma; Wendell Phillips, Southwestern Bell Telephone Co., Oklahoma City, Oklahoma
- PACIFIC NORTHWEST**—Grant I. Butterbaugh, 6815 20th Avenue, N. E., Seattle 5, Washington; Clyde Court-nage, Accounting Dept., Frederick & Nelson, 5th at Pine, Seattle, Wash-ington
- PHILADELPHIA**—Raymond T. Bowman, 531 Berwyn Road, Drexel Hill, Penn-sylvania; Haym Jaffe, 248 Rocklyn Road, Upper Darby, Pennsylvania
- PUERTO RICO**—Rafael de J. Cordeto, Puerto Rican Economic Association, P. O. Box 2003, University Station, Rio Piedras, Puerto Rico; Luz M. Tortuellas, Puerto Rican Economic Association, P. O. Box 2003, Uni-versity Station, Rio Piedras, Puerto Rico
- SACRAMENTO**—Sam Osofsky, State Divi-sion of Highways, Sacramento, Cali-fornia; Norman Rudy, Sacramento State College, Sacramento, California
- SAN FRANCISCO**—Harry S. Schwartz, Fed-eral Reserve Bank of San Francisco, San Francisco 20, California; William A. Hurst, Federal Reserve Bank of San Francisco, San Francisco 20, California
- ST. LOUIS**—Roy Wenzlick, c/o Roy Wenzlick & Co., 706 Chestnut Street, St. Louis 1, Missouri; Joan Fredericks, Joan Fredericks Market Research, 1602 Locust Street, St. Louis, Missouri
- TULSA**—Leslie Brooks, Leslie Brooks & Associates, 815 Daniel Building, Tulsa, Oklahoma; Erwin F. Terry, 1932 North Elwood, Tulsa 6, Okla-homa
- WASHINGTON**—Frederick V. Waugh, Asst. Chief, Bureau of Agricultural Economics, U. S. Dept. of Agricul-ture, Washington, D. C.; Margaret Martin, Office of Statistical Stand-ards, Bureau of The Budget, Room 440, Washington 25, D. C.

## THE FUTURE ANNUAL MEETINGS OF THE ASSOCIATION WILL BE HELD AS FOLLOWS:

	Headquarters	Dates
1953—Washington, D. C.	Shoreham Hotel	December 27-30, 1953
1954—Montreal, Canada	Hotel Mt. Royal	September 10-13, 1954
1954—Regional Meeting, San Francisco	(This will be held in December. Final dates and hotel have not yet been chosen.)	
1955—New York City	Hotel Biltmore	(Late in December. Final times not yet chosen.)

## REPORT OF ASA ADVISORY COMMITTEE—CONTINUED FROM PAGE 28

application both of new techniques and new equipment—such as the Bureau of the Census, Bureau of Labor Statistics, the National Office of Vital Statistics and the Bureau of Agricultural Economics. The materials developed in one agency are (or should be) made available, under proper safeguards, for use by other agencies, where their combination with related data can improve the accuracy and the usefulness of government data, reduce the cost to the taxpayer and lighten the burden on respondents. The introduction of new techniques is possible because their cost can be distributed over the range of government data collections.

If the Government statistical agencies are efficiently run (and if they are not, the solution would be to correct inefficiencies), and if the same professional standards are maintained, it would scarcely be possible to conduct surveys at lower cost by contract with outside agencies except under special conditions or circumstances.

The Committee recognized two types of special situation that would justify conducting a large-scale statistical survey by contract with a nongovernmental organization: (1) the surveys were

of an experimental character, where the individuals conversant with a particular technique are in nongovernmental agencies; and (2) the surveys were single-time surveys where a contracting agency has specialized knowledge of the subject-matter. As already stated, the burden of proof must be on demonstrating that a proposed survey meets these special conditions and hence should be conducted by contract.

WILLIAM J. CARSON, *Secretary*

### *Members of Committee*

William G. Cochran  
E. Dana Durand  
Simon Kuznets  
Isador Lubin  
William F. Ogburn  
Lowell J. Reed  
Samuel S. Wilks

A report of the Advisory Committee on Statistical Policy, "Statement of Principles on Budget Bureau Review of Data Collections Sponsored by Federal Agencies", will be published in the December issue of the *American Statistician*.

## CHAPTER NOTES

### ALBANY

The Chapter's annual business meeting was held on June 11, 1953. The 1952-53 officers were re-elected for another year, and there was a special showing of a motion picture describing I.B.M.'s newest mechanical brain, the No. 701. The officers are:

*President*.....Murray Dorkin  
*Vice-President*.....James T. Russell  
*Secretary*.....

*Treasurer*.....Abbott S. Weinstein

In June the Albany Chapter acted as host to a visiting delegation of the heads of statistical departments of the federal and state governments of Germany. A luncheon was held and arrangements were made for the visitors to call upon New York State departments in which they were particularly interested.

### BOSTON

The annual meeting of the Chapter was held at the Boston University Faculty Club on May 28, 1953. The speaker of the evening was Dr. Eugene W. Pike, who outlined the place of

statistics in the logical structure of engineering and the physical sciences with illustrations drawn from successful work by statisticians in these fields. The following officers were elected to serve for the 1953-54 fiscal year:

*President*.....Dr. Sybil P. Bindloss  
*Vice-President*.....E. L. Quirin  
*Secretary*.....Mary E. Wilcox  
*Treasurer*.....Robert L. Hurley  
*Councillors*.....Wendell D. Macdonald,  
Prof. Henry H. Stafford

### CHICAGO

At the luncheon meeting on May 21, 1953, Dr. Jack R. London of the Industrial Relations Center of the University of Chicago reported on a survey of union labor attitude toward unions. The May dinner meeting heard Jim Grantham of Grantham Graphics, and Dallas Johnston of Findlay-Johnston, on the subject, "Statistics Can Be Fun", a discussion of the making and presentation of charts.

The Annual Forecast Meeting was held on June 17th. This is a meeting devoted to the economic outlook for the next year. Garfield V. Cox of the

University of Chicago's School of Business was moderator, and other members of the panel included Ernest Baughman, Agricultural Economist, Federal Reserve Bank; D. E. Mackelmann, Deputy Housing and Re-development Coordinator of the City of Chicago; W. C. Norby, Assistant Vice-President of the Harris Trust and Savings Bank; and A. Arthur Charous, Business Economist, Sears, Roebuck and Company. Members of the Chapter were invited to forecast four indexes for October 1953 and April 1954—total personal income, total civilian employment, industrial production (FRB Index) and wholesale prices (BLS Index).

The new officers for 1953-54 are:

*President*.....De Ver Sholes

*Vice Presidents:*

*Dinner Meetings*.....John Coulson  
*Luncheon*.....

*Meetings*.....Elizabeth Slotkin

*Membership*.....Rudolph T. Ericson

*Secretary*.....John H. Oberndorf

*Treasurer*.....Helen Farrell

*For Representative on District*

*Committee*.....Adolph O. Berger

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## CHAPTER NOTES

CONTINUED FROM PAGE 33

### CENTRAL INDIANA

The last meeting of the 1952-1953 year was held May 28th. Professor Carl F. Kossack, Director of the Statistical Laboratory and retiring president of the Central Indiana Chapter, spoke on "The Responsibility of the Statistician". Officers were elected for the coming year. They are:

*President*.....William H. Andrews  
*1st Vice President*.....Paul Irick  
*2nd Vice President* Richard H. Shaw  
*Secretary*.....  
*Treasurer*.....Donald L. Cheak

### COLUMBUS

Newly-elected officers for the year 1953-54 are as follows:

*President*.....John R. Ervin  
*1st Vice*.....  
*President*.....Dr. Ann Pike Ulrey  
*2nd Vice-President* Melvin C. Koch  
*Secretary*.....  
*Treasurer*.....Dr. M. V. Condoide  
*Corresponding*.....  
*Secretary*.....Chalmers A. Monteith

### DAYTON

The following officers have been elected:

*President*.....Paul R. Rider  
Chief Statistician, Aeronautical Research Laboratory, Wright-Patterson Air Force Base  
*Vice-President*.....Forest M. Danson  
Budget Administrator, Plans and Programs Office, Directorate of Procurement and Production, Wright-Patterson Air Force Base  
*Secretary-Treasurer*.....Hugh B. Lewis  
Statistician, Aeronautical Research Laboratory, Wright-Patterson Air Force Base

### DENVER

At the annual meeting held on May 14th, the following officers were elected for the 1953-54 year:

*President*.....Paul R. Merry  
Associate Director, Bureau of Business and Social Research, University of Denver  
*1st Vice-President* Roland A. Mandat  
Actuarial Clerk with Coates, Herfurth and England, Denver, Colorado  
*2nd Vice-President*.....Edna Bigelow  
Statistician, State Department of Revenue  
*Secretary-Treasurer* Henry C. Mosher  
Economic Statistician, Mountain States Telephone and Telegraph Co., Denver, Colorado

### HAWAII

At the dinner meeting held June 15, 1953, Dr. Oscar Zoebisch, Assistant Manager of Research, Libby, McNeill & Libby, spoke on "Statistical Methods Used in Pineapple Research". Dr. Zoebisch discussed techniques of sequential sampling used in controlling the quality of canned pineapple, and recent field tests on fertilizers and insecticides. At the luncheon meeting on July 28th the speaker was Dr. Martin G. Glaeser, Chairman of the Economics Department of the University of Wisconsin. Dr. Glaeser spoke on "Economics and Statistics in the Service of Public Utilities."

### PHILADELPHIA

The following officers have been elected for the year 1953-54:

*President*.....Dr. Raymond T. Bowman  
Wharton School, University of Pennsylvania  
*Vice-President*.....John L. Martin  
Rayon Trade Analysis, E. I. du Pont de Nemours & Co., Wilmington, Del.  
*Secretary-Treasurer*.....Dr. Haym Jaffe  
Drexel Institute of Technology

### WASHINGTON, D. C.

The subject of the June 8th meeting was "What Do We Know About Income, Wealth and Welfare Distributions?" Dorothy Brady, Chief of the Division of Prices and Cost of Living of the Bureau of Labor Statistics, reviewed progress in these fields and assessed plans for future development. Stanley Lebergott of the Bureau of the Budget led the discussion.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF *The American Statistician*, published 5 times yearly at Washington, D. C., for October, 1953.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Statistical Association, 1108 16th Street, N.W., Washington, D. C.; Editor, Almarin Phillips, Dietrich Hall, University of Pennsylvania, Philadelphia, Pa.; Managing editor, none; Business manager, none.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member must be given.) American Statistical Association, 1108 16th Street, N.W., Washington, D. C.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

American Statistical Association  
by: Edgar M. Blyzer,

Office Manager

Sworn and subscribed before me the 25th day of September, 1953.

Mary P. Windsor,

Notary Public

(My commission expires April 14, 1954.)



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